

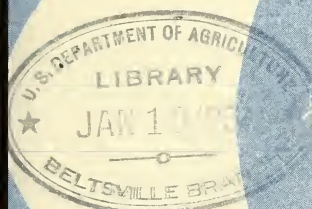
## Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.



4C  
934  
p 2

# IRRIGATION- ENTERPRISE ORGANIZATIONS

A black and white illustration of a farmer wearing a hat and a long coat, standing in a field and plowing with a team of oxen. The field is divided into rows, and there are trees in the background.

Prepared under a  
Cooperative Agreement between  
Soil Conservation Service  
and  
Bureau of Agricultural Economics

Circular No. 934

UNITED STATES DEPARTMENT OF AGRICULTURE





# Circular No. 934

October 1953 • Washington, D.C.

UNITED STATES DEPARTMENT OF AGRICULTURE



## IRRIGATION-ENTERPRISE ORGANIZATIONS

By WELLS A. HUTCHINS, *Soil Conservation Service*  
H. E. SELBY, formerly *Bureau of Agricultural Economics*  
STANLEY W. VOELKER, *Bureau of Agricultural Economics*

### CONTENTS

	<i>Page</i>
Introduction .....	5
Terminology .....	6
Principal Types of Irrigation-Enterprise Organizations.....	7
Importance of type of organization.....	7
Districts .....	8
Irrigation districts .....	8
Other districts for irrigation purposes.....	8
General district legislative acts.....	8
Special district legislative acts .....	9
Mutual irrigation companies.....	9
Commercial irrigation companies .....	9
Relative extent of types of organizations.....	11
Changes in organization .....	12
Interrelationships of organizations.....	12
Characteristics of Irrigation-Enterprise Organizations.....	13
Purpose of organizing .....	13
Districts .....	13
Mutual irrigation companies .....	14
Commercial irrigation companies .....	14
Organizational procedure .....	14
Districts .....	14
Irrigation districts .....	15
Other districts .....	15
Mutual irrigation companies .....	16
Incorporated companies .....	16
Unincorporated associations .....	16
Former corporations .....	16
Commercial irrigation companies .....	17

	<i>Page</i>
Characteristics of Irrigation-Enterprise Organizations—Continued	
Powers .....	17
Irrigation districts .....	17
Mutual irrigation companies .....	18
Corporations .....	18
Unincorporated associations .....	18
Former corporations .....	19
Commercial irrigation companies .....	19
Fundamental distinction between mutual and commercial service .....	19
Type of agriculture .....	20
Water supply .....	21
Capital and financing .....	22
Irrigation districts .....	23
Bonds .....	23
Proceeds of assessment levies .....	25
Federal reclamation construction repayment contracts... ..	25
Refinancing .....	27
Defaults .....	27
Other districts .....	28
Incorporated mutual irrigation companies .....	28
Capital stock .....	29
Bonds .....	31
Other sources of financing .....	33
Federal reclamation construction repayment contracts... ..	33
Refinancing .....	33
Defaults .....	34
Unincorporated irrigation associations .....	34
Commercial irrigation companies.....	34
Capital stock .....	34
Bonds .....	36
Methods of financing .....	36
Current financial status .....	37
Revenue .....	38
Irrigation districts .....	38
Assessments against lands.....	38
Tolls .....	39
Revenue from service of water to lands outside boundaries .....	40
Use of assessments and tolls.....	40
Enforcement of payment of assessments and tolls.....	41
Other districts .....	41
Incorporated mutual irrigation companies.....	42
Assessments against shares of capital stock.....	42
Assessments of nonstock companies.....	44
Tolls .....	44
Service of water to nonstockholders.....	45
Unincorporated irrigation associations .....	45
Commercial irrigation companies .....	45
Private-contract companies .....	45
Public-utility companies .....	46
The "water-right bonus" charge .....	47
Water service .....	47
Water privileges under irrigation organizations.....	47
Application of water-right laws to irrigation organizations .....	47
Appurtenance of water rights and water privileges to land .....	48
Individual water privileges .....	51
Allocations of water to conform to land requirements .....	53
limited .....	53
Distribution of water .....	54
Point of delivery of water .....	54
Method of water delivery .....	55
Measurement of water .....	55
Cost of irrigation water.....	56
Management .....	56
Control of management .....	56
Character of management .....	57

## Characteristics of Irrigation-Enterprise Organizations—Continued

Quality of service .....	57
Districts .....	58
Mutual irrigation companies .....	58
Commercial irrigation companies .....	58
Management-consumer relationships .....	58
Exemptions from taxation .....	59
Federal income tax .....	59
Districts .....	59
Mutual irrigation companies .....	59
Commercial irrigation companies .....	60
State taxation .....	60
Irrigation districts .....	60
Mutual irrigation companies .....	60
Commercial irrigation companies .....	61
Inclusion of land in irrigation projects .....	61
Inclusion of land at time of organization .....	61
Irrigation districts .....	61
Nontaxing organizations .....	62
Inclusion of land in organized enterprises .....	63
Irrigation districts .....	63
Nontaxing organizations .....	63
Exclusion of land from irrigation projects .....	64
Exclusion at time of organization .....	64
Irrigation districts .....	64
Nontaxing organizations .....	64
Exclusion of land from organized enterprises .....	64
Irrigation districts .....	64
Nontaxing organizations .....	64
Public Supervision and Regulation .....	65
Irrigation districts .....	65
Organization .....	65
Engineering plans, estimates, and financing .....	65
Revenue and service .....	66
Mutual irrigation companies .....	66
Organization .....	66
Issuance of securities .....	66
Revenue and service .....	66
Commercial irrigation companies .....	66
Private-contract companies .....	66
Organization .....	66
Issuance of securities .....	67
Revenue and service .....	67
Public-utility companies .....	67
Organization .....	67
Security issues, construction, and accounting .....	67
Regulation of public-utility irrigation company rates .....	67
Distinction between private-contract and public-utility service of water .....	68
Operation of rate regulation .....	71
Regulation of public-utility irrigation company service .....	74
Advantages and Disadvantages of Types of Irrigation Organizations .....	74
Procedure for organizing .....	74
Irrigation districts .....	74
Other districts .....	75
Mutual irrigation companies .....	75
Corporations .....	75
Unincorporated associations .....	76
Commercial irrigation companies .....	76
Comparison .....	76
Inclusion of land in irrigation projects .....	76
Financing .....	77
Irrigation districts .....	77
Private financing .....	77
Public financing .....	77

	<i>Page</i>
Advantages and Disadvantages, etc.—Continued	
Mutual irrigation companies .....	78
Corporations .....	78
Unincorporated associations .....	78
Commercial irrigation companies .....	78
Comparison .....	79
Revenue .....	79
Irrigation districts .....	79
Other districts .....	80
Mutual irrigation companies .....	80
Corporations .....	80
Unincorporated associations .....	81
Commercial irrigation companies .....	81
Development companies .....	81
Private-contract companies .....	81
Public-utility companies .....	82
Comparison .....	82
Allocations of water privileges .....	82
Exemptions from taxation .....	83
Attitude of water users .....	84
Other topics .....	84
Public supervision of enterprise activities .....	84
Eminent domain .....	85
Overhead .....	85
Availability of public records .....	85
Adaptability of Type of Organization to Enterprises Studied.....	86
Irrigation districts .....	87
Other districts .....	88
Mutual irrigation companies .....	89
Commercial irrigation companies .....	89
Summary of probable results under other types of organization....	91
Success or Failure of Irrigation Enterprises .....	91
Meaning of success or failure .....	91
Factors that influence financial success or failure.....	92
Relation between costs and benefits of water.....	92
Costs of irrigation water.....	93
Fixed and variable charges for water.....	93
Factors that affect construction costs .....	94
Relation between indebtedness and annual charges.....	95
Relation between annual water charge and type of agri- culture .....	96
Reasonableness of costs of water .....	97
Benefits from irrigation water .....	98
Land and water .....	98
Producing lands .....	99
Returns from farming operations .....	100
Effects of depression of 1930's upon project credit.....	100
Variability of cost-benefit ratios .....	102
Relation of type of organization to success or failure.....	102
Meeting financial obligations .....	103
Development of successful irrigation farming communities....	104
Efficiency of operation .....	104
Summary of relationships .....	104
Literature Cited .....	106



## INTRODUCTION

Many irrigation projects have been developed in the Western States. The legal forms of the organizations under which they were set up included irrigation districts and several types of both mutual and commercial companies. Some of the projects failed; others have been successful throughout their history.

Because many more such projects are likely to be developed in the future, the Soil Conservation Service and the Bureau of Agricultural Economics of the United States Department of Agriculture undertook a study of these various types of organizations. The study was designed to obtain answers to certain questions concerning them. Do the reasons for the success or failure of the projects lie in the type of legal organization under which they were developed? Which of the types are best adapted to the varying economic and climatic conditions found in the West? How adaptable will the different kinds of organizations be to situations that are likely to arise in the future?

Field work for the study was conducted chiefly in 1946 and 1947.<sup>1</sup> A progress report was submitted by the authors to the participating agencies in October 1948 for the immediate use of those agencies. This report summarizes the results of the study and coordinates them with those from previous studies of such organizations.

From the study an attempt was made to learn not only the advantages and disadvantages of each type of organization in the development and operation of irrigation projects but also the influence of the various provisions of pertinent Federal and State laws on the solution of problems that arise in managing such enterprises.

The study included 54 irrigation enterprises. For 2 of these, both mutual-company and overlying irrigation-district organizations were involved; hence 56 organizations were studied. These 56 organizations comprised 29 districts, 17 mutual companies, and 10 commercial companies. The districts were further subdivided into 24 irrigation districts, 1 water district, 1 electrical district, 2 public power and irrigation districts, and 1 water-conservancy district. The enterprises selected represented the three principal types of formal organizations, the different States in which irrigation is important, and intensive and extensive types of irrigation farming. Intensive-farming enterprises were defined as those with 50 percent or more of the irrigated acreage in fruits and vegetables. Distribution of enterprises by State,

---

<sup>1</sup> The study was conducted by Wells A. Hutchins, Soil Conservation Service, H. E. Selby, formerly Bureau of Agricultural Economics, Stanley W. Voelker, Bureau of Agricultural Economics, and Alexander Joss and Karl S. Landstrom, formerly Bureau of Agricultural Economics. Harry A. Steele, Bureau of Agricultural Economics, helped to plan the study.

type of farming, and type of organization is shown in table 1. Detailed information concerning each enterprise was obtained in personal interviews with one or more of its officers and from additional sources.

#### TERMINOLOGY

*Irrigation enterprise* was defined by the Irrigation Census of 1940 (22, p. XI) <sup>2</sup> as "an independent irrigation establishment owning or operating works for supplying water to agricultural land. An enterprise may represent a short canal or a pumping plant watering a single small farm, or a great system of canals and reservoirs operated under one management supplying thousands of farms."

When systems that serve a number of water users are involved, the term "irrigation project" is practically synonymous with the term "irrigation enterprise." In either case, the term includes not only the physical works but all the affairs of the undertaking.

An irrigation-enterprise organization, or irrigation-project organization, is the legal form of the enterprise or project. Forms or types of organization are: (1) Private associations, which include (a) nonprofit and profit corporations, (b) unincorporated groups which operate under signed specific agreements, and (c) groups held together by verbal or implied compacts;<sup>3</sup> and (2) public or governmental entities or agencies, including districts, other political subdivisions, and agencies of the State and Federal governments.

<sup>2</sup> Italic figures in parentheses refer to Literature Cited, p. 106.

<sup>3</sup> An arbitrary classification on the basis of formality might exclude group (c) from a list of organizations. So far as this study is concerned, it is an academic matter, as all private associations studied were incorporated companies.

# PRINCIPAL TYPES OF IRRIGATION-ENTERPRISE ORGANIZATIONS

## IMPORTANCE OF TYPE OF ORGANIZATION

The type or form of organization adopted by an irrigation enterprise is vitally important, for upon it depend not only the legal powers of the enterprise but also the relations between the organization and the users of water. The form may be changed—for example, from private company to public district—without change in the physical works or in methods of operating and maintaining the system and delivering water. But a change in type or form may mean fundamental changes in the powers of the organization, in control over the management, in obligations of the users of water to provide revenue for the project, and in methods of collecting revenue. In some cases, it may necessitate adjustments in the basis of farmers' rights to receive water.

TABLE 1.—*Number of enterprises studied, by type of farming and by organization, specified States*

State	Type of farming						Total
	Intensive			Extensive			
	District	Mutual com- pany	Com- mercial company	District	Mutual com- pany	Com- mercial company	
	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Number</i>
Arizona.....				<sup>1</sup> 1	1		<sup>1</sup> 2
California.....	3	1	1	2	1	2	10
Colorado.....	1		1	2	1		5
Idaho.....				3	2		5
Kansas.....					1		1
Montana.....				2	1		3
Nebraska.....				3	1	1	5
Nevada.....					1		1
New Mexico.....				1	1		2
North Dakota.....				1			1
Oregon.....	1	1		1		1	4
South Dakota.....					1		1
Texas.....	1		1	1			3
Utah.....		1			2	1	4
Washington.....	2			1			3
Wyoming.....				<sup>1</sup> 1	1	2	<sup>1</sup> 4
Total.....	8	3	3	<sup>1</sup> 19	14	7	<sup>1</sup> 54

<sup>1</sup> In the Arizona and Wyoming enterprises with mutual-company organization, overlying district organizations also were studied. This made 2 district organizations in each of these States, or a total of 56 organizations that were studied in connection with the 54 enterprises.

Aside from Federal agencies such as the United States Bureau of Reclamation and the Office of Indian Affairs, with which this study is only indirectly concerned, the principal types of irrigation-



enterprise organizations consist of districts and companies.<sup>4</sup> District enterprises are owned and operated by the public.<sup>5</sup> Company enterprises are privately owned and operated, although if they are public utilities, they may render service to the general public within their service areas.

## DISTRICTS

### IRRIGATION DISTRICTS

An irrigation district is a public or quasi-municipal corporation, organized under general State laws primarily to provide water for irrigating the lands within its boundaries. It has both the power to issue bonds and to tax. Its revenue comes chiefly from assessments levied upon the land. If the lands of an objecting minority are expected to benefit from the district improvements, they may be included and assessed (14, pp. 2-3).

Each of the 17 Western States has an irrigation-district law. In some of these States such districts are known as water-conservation, water-improvement, or reclamation districts, and the like. But the fundamental attributes of all such districts are similar throughout the West.

### OTHER DISTRICTS FOR IRRIGATION PURPOSES

Districts other than standard irrigation districts are authorized under the laws of various States to further irrigation of farm lands. Some of these districts have power to issue bonds secured by the lien of assessments against the land; others have no powers of taxation and may issue revenue bonds only.

Many types of water-improvement districts other than irrigation districts exist. California statutes alone authorize the formation of 34 types of districts relating to development, conservation, use, disposal, and avoidance of water, many of which may provide for irrigation (7). In several States, districts of two or more types are authorized for irrigation purposes; in others the standard irrigation district is the only type.

The present study includes an Arizona electrical district, a California water district, a Colorado water-conservancy district, and two Nebraska public power and irrigation districts.

### GENERAL DISTRICT LEGISLATIVE ACTS

Irrigation and related districts are formed under general acts of State legislatures. Organization of each district must conform to the general procedure set forth in the enabling statute.

<sup>4</sup> Some of the western State governments have developed irrigation projects, but aside from districts, which are sometimes characterized as State agencies, very few irrigation projects have been constructed by States. According to the California Water Code (3, sec. 20570), "It is reaffirmed that districts are state agencies formed and existing for governmental purposes."

<sup>5</sup> "An irrigation district is an agency of the state and its functions are exclusively governmental. It owns no lands in a proprietary sense; its property is owned by the state and held only for governmental purposes." *Allen v. Hussey*, 101 Calif. App. (2d) 457, 467, 225 Pac. (2d) 674, 680 (1950; hearing denied by supreme court 1951).



## SPECIAL DISTRICT LEGISLATIVE ACTS

In addition to those districts under the general district acts, a number of districts formed for irrigation purposes have been organized under special acts of State legislatures. State legislatures have constitutional authority to organize taxing districts with boundaries defined in the legislative act, without submitting the question to a vote of property owners within the areas.

## MUTUAL IRRIGATION COMPANIES

Mutual or cooperative irrigation companies are private associations of irrigation farmers, organized for the purpose of providing irrigation water at cost, primarily for the use of their members. As contrasted with the inclusion of lands of unwilling owners in irrigation districts, membership is voluntary. In parts of the West, and particularly in southern California, these organizations are known as mutual water companies (8, 10, 15, 16).

The larger mutual irrigation companies are incorporated. The Irrigation Census of 1940 (22, p. 4, tables 6 and 7) reported that about 61 percent of all enterprises classified as mutual or cooperative irrigation companies in that canvass were incorporated. The classification in the Irrigation Census of 1950 differs from the one in 1940. The 1950 Census classified informal arrangements between two or more neighboring farmers for operation of works for their joint use as unincorporated mutual enterprises. In 1940, these arrangements were classified as individual and partnership enterprises. In comparing statistics for irrigation enterprises reported in these two periods, this difference should be noted. Of the mutual irrigation enterprises reported in 1950, 31 percent were incorporated (23, p. 58, table 16).

Each State has a general corporation law. These laws are sometimes so entitled as to refer to "corporations for profit," whereas mutual irrigation companies are nonprofit. But the essential character of the enterprise can be clearly stated in the articles of incorporation. General corporation laws are adapted to the functioning of irrigation enterprises and are widely used for their incorporation. Various States also have laws that govern the organization of cooperative associations for agricultural purposes. Although some of these laws may be applicable, very few irrigation companies have been organized under them.

Unincorporated mutual irrigation enterprises are divided into two groups: (1) Those that have never been incorporated; and (2) those that have lost their corporate status and now function with the form but without the powers of a corporation.

## COMMERCIAL IRRIGATION COMPANIES

Commercial irrigation companies are organized for the purpose of building and operating irrigation works for the profit of persons who provide the capital for and retain temporary or permanent ownership of the irrigation system (12). With respect to ownership of irrigation facilities, commercial companies differ from

districts and mutual companies, in that the latter, although public in the one case and private in the other, are both nonprofit, cooperative enterprises under local ownership and control.<sup>6</sup> Ownership of the assets of a commercial irrigation company in a Western State may be held by persons who live elsewhere in the United States or abroad. In some isolated cases water users may own stock in the commercial company that serves them.<sup>7</sup>

Commercial companies are usually incorporated, although incorporation is not necessary for commercial irrigation service. An individual may engage in public-utility service of water and his venture may thereby be classed as a public utility, subject to whatever regulation the State may provide for the service of water to the public.<sup>8</sup>

Commercial companies may select their own consumers and fix the relationship by contract. However, a company may dedicate its water supply (or a portion thereof) to the public within the service area and may "hold itself out" as engaged in public service. If it does this, it must serve all who apply, to the extent of its water supply or portion thereof so dedicated to public use, so long as such applicants pay the lawfully prescribed rates. In either event, establishment of relations with the company is voluntary on the part of farmers within the service area.

Historically, commercial companies have been divided into three classes: (1) Construction or development companies, intended to sell "water rights"<sup>9</sup> to prospective users and to retire from business upon the sale of all such rights and transfer of the system to the water users; (2) private-contract companies, intended to sell "water rights" to purchasers of land, or other selected individuals, under contracts or deeds providing for perpetual service

---

<sup>6</sup> Ownership of the properties of an irrigation district may be held to be in the public or in the State, depending upon the legal questions involved, but control is vested in representatives selected by the local community.

<sup>7</sup> The California Railroad Commission (now the Public Utilities Commission) in several decisions held that to extend to stockholders of a public-utility water company a preference in rates or service not extended to other consumers is undue discrimination; that the fact that a consumer may be a stockholder does not change his status as a consumer (29, pp. 144-145).

<sup>8</sup> The California Public Utilities Code (5, secs. 2701 and 2704) provides that "any person" etc. who sells water under contract or otherwise shall be a public utility. But it exempts from public regulation the owner of a water supply who uses it primarily for his own domestic purposes or to irrigate his own lands, who sells the surplus for domestic purposes or for irrigation of neighboring lands, who in an emergency water shortage sells water from his supply for not more than one irrigation season, or who sells a part of the water as an accommodation to neighbors who have no other supply.

<sup>9</sup> The so-called "water right" sold by a commercial company is a perpetual right to the service of water from the system—the right of the user as against the company itself. This right is not synonymous with the water right of legal nomenclature, which is a right acquired under State law by appropriation, or derived through the ownership of land riparian to a watercourse or overlying a ground-water supply. This loose application of the term has been common in connection with the service of commercial companies. When shown in quotation marks in this publication, "Water right" refers to the right of continued delivery of water acquired by a prospective consumer from a commercial company, and evidenced by a deed or contract, and not to water right in its strict sense.



by such companies, their rates and services *not* being subject to public regulation; and (3) public-utility companies, intended to serve water to all applicants within the service area to the extent of the water supply—that is, to the public—either under permanent contracts or temporary rentals, their rates and services being subject to public regulation. Thus construction or development companies were intended as temporary agencies, and private-contract and public-utility companies for permanent existence.

The theoretical distinction between classes of service rendered by private-contract companies and public-utility companies has been long established in rate-making cases. It is of fundamental importance when the question of public regulation of commercial-company rates is raised. This is because public-utility rates and services are subject to public regulation, whether or not consumers have permanent water contracts with the companies. Rates fixed by those contracts which in the technical legal sense are private contracts cannot be disturbed by public authority. The practical application of this principle involves some fine distinctions and legal technicalities.

#### RELATIVE EXTENT OF TYPES OF ORGANIZATIONS

The Irrigation Census of 1940 (22, p. XXIX, table 4; p. 4, table 6) reported data with respect to irrigation enterprises of different organizational types. These data are shown in table 2.

From 1930 to 1940, the number of commercial companies declined from 391 to 275 enterprises. The number of enterprises of other types increased substantially (21, p. 54, table 12).

The 1950 Irrigation Census reports a total of 123,926 irrigation enterprises in the 17 Western States, Arkansas, Louisiana, and Florida. This includes 489 districts, of which 483 are in the 17 Western States. It also includes 446 commercial companies, of which 131 are in the 17 Western States and 270 in Louisiana alone (23, p. 58, tables 15 and 16).

TABLE 2.—*Number of irrigation enterprises, area irrigated, and capital invested, by type of organization, 1940*<sup>1</sup>

Type of organization	Enter- prises	Area irrigated	Capital invested
	<i>Number</i>	<i>Acres</i>	<i>Dollars</i>
Individual and partnership.....	86,050	7,314,152	187,382,730
Cooperative.....	4,356	6,652,488	224,140,876
Irrigation district.....	427	3,514,702	265,737,810
Commercial.....	275	1,017,781	66,243,823
U. S. Bureau of Reclamation.....	97	1,824,004	250,245,359
All other.....	432	680,612	58,298,603
Total.....	91,637	21,003,739	1,052,049,201

<sup>1</sup> Based upon United States Bureau of the Census, Sixteenth Census of the United States: 1940, Irrigation of Agricultural Lands. (22, p. XXIX, table 4; p. 4, table 6).

## CHANGES IN ORGANIZATION

Historically, many changes have been made in irrigation enterprises in the West. Enterprises included in the study reported upon here exemplify the process of change thus:

About two-fifths of the 54 enterprises in question have always had their present type of organization—district, mutual, or commercial—although in certain of these cases a mutual or a commercial company has succeeded another of the same type. The remaining enterprises have changed from one type of organization to another. In five of these instances, two changes were made. Of the enterprises studied, 52 percent are districts, 30 percent mutual companies, and 18 percent commercial companies. The original principal organizations for these enterprises were: Commercial companies 52 percent, mutual companies 29 percent, and districts 19 percent.

Large irrigation projects are no longer promoted by commercial enterprises. Ownership and control of the systems built by commercial or by development companies have passed in most cases to mutual companies and districts, as they were intended to do. Probably very few of the original companies of this type are still active. In many cases, private-contract and public-utility commercial companies have changed to mutuals or districts. This was done because of the increasing difficulty of operating such enterprises on a commercial basis, or because the water users wished to own the system that served them, or both. In some cases mutuals changed to the district type of organization mainly to obtain adequate financing for improvements, the cost of which exceeded their resources.

These shifts from one specific type of organization to another are fairly exemplified by the enterprises reported upon here. That is, the existing commercial companies in the study are now only about a third of the original commercial enterprises on these projects. The present mutual companies comprise several that began as mutual enterprises, a smaller number that began as districts, and 65 percent of the total number that originated as commercial enterprises. Of the present districts, only 31 percent began as districts, the others having been reorganized from commercial and mutual enterprises, chiefly the latter.

## INTERRELATIONSHIPS OF ORGANIZATIONS

Many instances of contractual relationships of one kind or another between irrigation organizations may be cited. These may relate to joint ownership and operation of storage works or other facilities, to the obtaining of water supplies by one organization from another, or to the carriage of water by one for another. One organization may own the main canal system and others may separately own the laterals. In other instances local improvement districts are formed under State enabling statutes within irrigation districts. In still others, mutual-company enterprises are located within irrigation districts, or irrigation districts and companies within an extensive district of special type,



such as a conservancy district. Here the functions of the overlying organization supplement those of the included organizations.

It follows that individual farms are often served either directly or indirectly by two or more irrigation organizations. Usually, the surface-water supply of a farm reaches it through only one local distribution system; but the water may be brought into that system from several sources and through the efforts of more than one irrigation organization. Many farms, however, receive water directly from two or more irrigation organizations. In some cases, the water from the different enterprises must be used on different parts of the farm. In others, water received directly from two or more enterprises is used on the same land; that is, one enterprise may furnish direct-flow early-season water, and another late-season stored water.

## CHARACTERISTICS OF IRRIGATION-ENTERPRISE ORGANIZATIONS

### PURPOSE OF ORGANIZING

#### DISTRICTS

A canvass of all irrigation districts in the West made in 1929 (14, pp. 13-14) showed that the 801 districts formed by the end of 1928 were about equally divided between those formed for entirely or principally new development (393 districts) and those formed principally for supplemental development or acquisition of existing works (408 districts). However, of the 499 irrigation districts then active,<sup>10</sup> 327, or 65 percent, were in the supplemental development group.

By far the larger number of the districts included in the study were formed in areas in which some irrigation development had already occurred, usually under some kind of formal organization. Thus ordinarily they involved reorganization from some other form of enterprise. The purposes of reorganizing included financing of additional water supplies—either natural flow, storage or both—consolidation of neighboring irrigation systems, reconstruction or extension of existing systems, or drainage of irrigated lands. Some districts replaced water users' associations on Federal reclamation projects, for the purpose of acting as fiscal agents for the United States in the collection of charges from water users and for the eventual operation of the project systems.<sup>11</sup> Still others were organized to take over and complete or rehabilitate irrigation systems constructed by development companies.

<sup>10</sup> Active districts included those in preliminary stages and under construction, as well as operating districts.

<sup>11</sup> The original policy of the Bureau of Reclamation (formerly the United States Reclamation Service) was to encourage the formation on Federal reclamation projects of water users' associations, which were private corporations. Several years' experience led the Bureau to encourage substitution of the irrigation-district form of organization for existing water users' associations and to insist upon the district form for most of the later projects (14, pp. 59-61).

Of those irrigation districts studied, only four were organized for the purpose of constructing entirely new irrigation projects.

#### MUTUAL IRRIGATION COMPANIES

Many mutual irrigation companies originated as subsidiaries of land-development companies. The usual procedure in these cases was for the promotion company (1) to acquire holdings of undeveloped land, (2) to build an irrigation system, (3) to organize an irrigation company, (4) to deed the irrigation system to the company in exchange for all its capital stock, and (5) to sell to settlers parcels of irrigable land together with proportionate shares of irrigation-company stock. When the majority of the acreage, or some higher percentage fixed by agreement, had been sold, the purchasers automatically assumed control of the irrigation enterprise, which thereupon acquired full mutual-company status.

Other mutual companies were organized by groups of settlers without outside promotion. The settlers took capital stock in exchange for their respective interests in the irrigation works that had been acquired by purchase or by doing construction work. Several of the mutual companies studied were formed to take over the systems of irrigation districts or commercial companies that had failed financially or that had proved unsatisfactory for other reasons.

#### COMMERCIAL IRRIGATION COMPANIES

Commercial irrigation companies included in the study are divided equally between (1) those that were originally promoted in conjunction with land-selling enterprises and (2) those that were not so promoted.

Promoters of most companies in the first group expected to derive profits from the sale of land. They bought large blocks of undeveloped land, built irrigation systems, and subdivided and sold the lands with "water rights" to settlers. Eventual transfer of the irrigation systems to the settlers was sometimes contemplated but for one reason or another it was not carried out.

Organizers of the commercial companies in the second group expected to profit from the sale of "water rights" and from annual charges made for operating the irrigation systems. Many of these projects were financed by managers of capital in the East and in Europe.

#### ORGANIZATIONAL PROCEDURE

##### DISTRICTS

A public district, whether an irrigation district or a district of some other type, is organized pursuant either (1) to the specific detailed procedure provided in a general act of the legislature, or (2) to a special act of the legislature, and in no other way. Most of the districts formed in the West for irrigation purposes were organized under general enabling acts, many of which require

a favorable vote on the part of either the landowners or the general electors within the boundaries of the proposed district.

#### IRRIGATION DISTRICTS

An irrigation district with defined boundaries is usually created by the county governing board or court, at the instance and with the consent of a designated fraction of the landowners or citizens within the area, expressed by petition, election, or both, depending upon the irrigation-district law of the particular State. That is, the organization of a district is ordinarily initiated by petition, some or all of the signers being owners of land within the proposed district (13, pp. 5-8).<sup>12</sup> The petition is presented to and acted upon by the governing body or court of the county in which the largest acreage of land proposed for inclusion is situated. Hearings are held at which applications for the inclusion or exclusion of lands are passed upon. The county tribunal must find whether the law has been complied with. It must also fix the boundaries of the proposed district in order not to exclude land that could be irrigated from the proposed source or sources, and not to include land that will not be benefited by inclusion.

Some statutes provide that a preliminary report by the State Engineer or other State official must be made before the organization of a proposed district is completed. In many States an election must be held and a favorable vote cast before the district may be declared to be organized. As it is a public or governmental organization, an irrigation district thus can be created against opposition expressed by the votes of a part of the community. The lands of the objectors are nevertheless included if these lands will benefit from the proposed improvement; and these lands, as well as those of the willing landowners, are subject to assessments for district purposes.

In many Western States, the engineering plan and method of financing of the proposed district are subject to review by designated State authorities. In most cases, their reports are advisory. In others, their approval of specific matters is required.

#### OTHER DISTRICTS

Methods of organizing other districts for irrigation purposes vary widely, even among the few types included here. For example, the organization of either an Arizona electrical district or a California water district is proposed by a petition signed by the requisite number of landowners in the proposed district. This is followed by a hearing before the board of county supervisors. An organization election is then held without referring the matter to any State administrative official. A Colorado water-conservancy district is formed by the district court of the county containing the largest acreage within the proposed district boundaries, upon petition signed by the required number of owners of irrigated and nonirrigated lands. A Nebraska public power and irrigation dis-

<sup>12</sup> Utah irrigation-district law (28, sec. 100-9-1) contains an optional provision that the petition may be signed by the Governor, upon recommendation of the State Engineer.



trict is formed by the State Department of Roads and Irrigation upon petition signed by 15 percent or more of the electors of each municipality and township within the proposed boundaries. Before it approves the formation of the district, the Department must study the proposed project and decide whether it is generally feasible.

#### MUTUAL IRRIGATION COMPANIES

##### INCORPORATED COMPANIES

The general corporation law of the State specifies the procedure for organizing a corporation. This generally includes the execution by a minimum number of persons of the articles of incorporation, which must contain statements on certain designated matters and may contain such others as the incorporators deem necessary. The articles are filed with a designated public official or officials, for example, the county clerk of the county in which the principal place of business is to be situated and the Secretary of State. In some States a certificate of incorporation is issued. In any State, the time at which the corporate existence begins depends upon the provisions of the statute.<sup>13</sup>

Issuance of securities by mutual companies is subject to restriction in States that have corporate securities acts known as "blue-sky laws". However, no report by a public official concerning the water supply or feasibility of a proposed enterprise is necessary before incorporation. No public hearings or elections are conditions precedent to organization, as is characteristic of the formation of irrigation districts.

##### UNINCORPORATED ASSOCIATIONS

Unincorporated irrigation associations are initiated, held together, and operated by means of contracts between the members. Organization of such an association involves only the execution of such a contract. The procedure as to organizing is whatever the members choose to make it. No controlling legislation is in effect and no specific procedure must be followed.

Membership contracts of unincorporated associations take various forms. Some are verbal understandings only. Other small groups of water users have short written agreements signed by the members. Others have more elaborate documents, which are signed and acknowledged by the participants. These documents are sometimes drawn up by attorneys along the lines prescribed by statute for articles of incorporation of corporations. Thus the forms of the governing contracts, whether verbal or written, simple or elaborate, and the processes of entering into the contracts, depend entirely upon the wishes of the contracting parties.

##### FORMER CORPORATIONS

Some unincorporated associations were formerly incorporated but have lost their corporate status. In some cases, this came

<sup>13</sup> The pertinent provisions of the California and Utah corporation laws are summarized in a study of mutual companies in these two States (16, pp. 190-200).



about because of failure to renew their corporate life upon expiration of the period of time for which they were incorporated. In others, it resulted from failure to file the annual reports required by law. In still other instances, formally incorporated irrigation companies have been classed by controlling State officials as delinquent and unauthorized to act as corporations because the company officers failed to pay the corporation tax, or, if non-profit, to file the statements necessary to establish exemption from payment of the tax.

#### COMMERCIAL IRRIGATION COMPANIES

The procedure in organizing a commercial irrigation company, incorporated or otherwise, is the same as that for organizing a mutual irrigation company. If incorporated, it is organized under the same law. It may be formed by the minimum number of incorporators specified by the corporation law. The State agency which regulates the rates and services of public-utility irrigation companies, in States that provide for such regulation, has jurisdiction only when the company is ready to engage in business. That is, a company may incorporate for the stated purpose of distributing water to the public for compensation, by following the procedure provided in the general corporation law, and without applying to the State regulatory commission for permission to organize. After organization, the actual performance of its functions becomes subject to regulation of whatever character the public-service legislation may provide.

#### POWERS

##### IRRIGATION DISTRICTS

The powers of an irrigation district are prescribed by the statute under which it is organized. It has no powers other than those specifically stated in the statute or necessarily implied thereby.<sup>14</sup> This limitation applies also to public districts of other types.

The basic powers accorded to irrigation districts in the various States are those necessary to accomplish the primary purpose of this type of organization, which is to provide water for the irrigation of lands and to tax the lands to pay the cost. To this end, the district may acquire water rights, water supplies, and other property by purchase or condemnation; it may construct and operate irrigation works; and it may deliver water for irrigation, domestic, and other purposes to lands within its boundaries. It may issue bonds or other obligations in order to obtain capital. It may also obtain revenue for the payment of interest and retirement of the principal of its indebtedness, and for the neces-

<sup>14</sup> "An irrigation district is a public corporation or agency and has only such powers as are given to it by the Legislature. Its board of directors has no power to dispose of the district's property other than in the manner provided by law, and all contracts or purported contracts of the district which are beyond the scope of the power given by statute are void." *Allen v. Hussey*, 101 Calif. App. (2d) 457, 472, 225 Pac. (2d) 674, 682-683 (1950; hearing denied by supreme court 1951).

sary expenses of operation and maintenance, from the levy and collection of assessments against benefited lands within its boundaries. In some cases this will be through its own district tax procedure and in others through the tax procedure of the county in which the district is located.

Additional powers are variously granted by the district statute. These may include authorization for making tolls or charges for the use of water, either in addition to assessments or in lieu of them; for making drainage improvements, and assessment of the cost against benefited lands; for generation and disposal of electric energy; for sale or lease of excess water for use within or outside the district boundaries, ordinarily for limited periods; and for cooperation with other districts and with State and Federal agencies.

#### MUTUAL IRRIGATION COMPANIES

##### CORPORATIONS

The powers of an incorporated mutual company are those conferred by the corporation law and by the articles of incorporation executed pursuant to the law, or necessarily implied by the purposes for which the company is formed. These powers usually include issuance of capital stock; incurring of indebtedness, issuance of bonds or other evidences of such indebtedness, and mortgaging of the company's property to secure its repayment; acquisition of water rights, water supplies, rights-of-way, and other property; acquisition, construction, and operation of irrigation works; diversion, impounding, and delivery of water for irrigation of shareholders' lands and for their domestic purposes; levy of assessments against the capital stock of the corporation for the purpose of obtaining revenue; and in many cases collection of tolls or charges for use of water (16, pp. 20-22). In many Western States mutual companies may condemn rights-of-way for the conveyance of water.

The mutual or nonprofit status of a corporation is often indicated by a statement in the articles that the principal purpose of the company is to provide water for irrigation and domestic uses to the holders of its capital stock only.

Bylaws govern the relations between stockholders and officers, and hold the officers to specific policies and procedures. Rules and regulations relate to delivery of water.

##### UNINCORPORATED ASSOCIATIONS

As unincorporated associations exist by virtue of simple agreement among members, they may engage in any enterprise in which a single natural person may engage. Necessarily, however, they do not enjoy the peculiar rights and privileges and the broad powers of internal administration that are incident to corporate status (16, pp. 25-27). In many Western States individuals may condemn rights of way across neighboring lands for their irrigation ditches, or they may have the right to enlarge a neighbor's ditch for the purpose of obtaining water for irriga-



tion, upon payment of just compensation. In these jurisdictions members of an unincorporated association may take such action jointly.

#### FORMER CORPORATIONS

Companies that have lost their corporate status are no longer entitled to exercise the powers and to enjoy the privileges of corporations. However, a number of irrigation associations of this kind continue to operate in much the same way as when their corporate charters were in effect. No written agreements among the water users are in effect, other than those contained in the articles of incorporation, bylaws, and stock certificates of the former corporate entity. These agreements, although no longer those of corporation stockholders, apparently have been continued in some cases by tacit consent of the parties, and in others without realization on their part that the corporate charter has expired.<sup>15</sup>

#### COMMERCIAL IRRIGATION COMPANIES

The powers of an incorporated commercial company are derived from the corporation law under which it is organized and from its articles of incorporation, as in the case of a mutual company. It may acquire properties by purchase. In addition, if it is a public utility, it has the broad powers of eminent domain accorded to corporations engaged in service to the public. The articles of incorporation may or may not delimit the area within which the company is empowered to serve water for compensation. In some cases, the extent of the service area is determined by the practices of the company in building its works and delivering water.

Many commercial companies that were organized primarily for irrigation service deliver water for other purposes as well—domestic, municipal, and industrial. Often these services give the company greater returns than its irrigation service. The revenue of a number of public-utility water companies in California from sales of water for domestic and industrial purposes exceeds that from sales for irrigation.

#### FUNDAMENTAL DISTINCTION BETWEEN MUTUAL AND COMMERCIAL SERVICE

The distinction between the services rendered by mutual irrigation companies and commercial companies, and the powers of these respective organizations to render the service, depends neither upon the law under which they were organized nor upon the method of organizing, as shown above. The distinction lies in the purpose of the company—in the one case, this is to provide

<sup>15</sup> In 1935 one of the authors of this report called the attention of officers of a small mutual company to the fact that the company was carried on the State list of delinquent corporations because of failure to pay the corporation tax or to establish the exemption accorded to nonprofit corporations, and that the company would be unable to embark upon a proposed undertaking until this situation was corrected. The surprised officers promptly took steps to have the company reinstated as a corporation.



water at cost to the members or stockholders only; in the other, to distribute water to selected consumers, or to the public, for the profit of the owners of the enterprise—and in the methods used to attain that purpose. Classification of an irrigation company as mutual or as commercial is of practical importance to both the company and the water users, with respect to tax liability and to public regulation of rates and services.

The articles of incorporation may limit a company to the service of water to its own stockholders. In this case, if a company actually delivers water to no one else, it is classified as mutual. This is the usual situation with respect to operating mutual irrigation corporations. However, various irrigation enterprises that have operated only on a mutual basis were originally incorporated with additional powers incident to commercial status. They have since found it advantageous to amend their articles of incorporation in order to restate their mutual purpose and limit their powers accordingly. A California enterprise, originally intended as mutual only, installed a subsidiary domestic water system and sold water therefrom to persons who were not stockholders. To avoid public regulation of its entire enterprise, this company organized a subsidiary public-utility corporation to handle the domestic service. All of the domestic company's stock was held by the irrigation company and the domestic company held enough shares in the irrigation company to cover its water requirements. In other instances, corporations that have dual powers or follow dual practices, partly mutual and partly commercial, have established their classification as either mutual or commercial by restating their corporate powers, either by amendment of their articles or by reincorporation, and by conforming thereto in actual practice.

#### TYPE OF AGRICULTURE

The history of irrigation development in the West reveals no significant relationship between type of management of projects and type of agriculture carried on in the area affected. Development by commercial companies occurred in areas in which intensive irrigation farming, including production of citrus crops, had been carried on for many decades. It occurred also in areas in which general farming had consistently prevailed. But regardless of the type of farming, mutual companies succeeded many of these commercial enterprises. In Utah, where both intensive and extensive irrigation farming is carried on in various parts of the State, mutual enterprises have been the rule from earliest times. Districts, also, have operated in the West under many types of farming. Selection of a type of organization for a given or a proposed enterprise has depended upon various factors. Probably, type of farming has been the controlling factor in only a few cases. So far as the enterprises included in the study are concerned, organization and reorganization in various forms took place without regard to type of farming. This is apparently true of irrigation projects generally.

In each group of organizations the agriculture of individual

enterprises ranged from extensive, in which the crops were chiefly hay and grain, with very few or no intensive crops such as sugar beets, vegetables or fruit, to an intensive type in which almost the entire acreage was in orchards. Mutual companies had a somewhat lower proportion of intensive crops and districts a somewhat higher proportion. General farming predominated in 39, or more than two-thirds, of the enterprises in the study.

The three types of organizations were comparable in average acreage irrigated per enterprise. Mutual companies and districts averaged about 20,000 acres each and commercial companies about 17,000 acres.

Irrigated acres per farm, averaged for all enterprises and all types of agriculture in the several groups, were 51 for commercial companies, 59 for districts, and 88 for mutuals. Type of organization apparently did not influence these differences.

The size of irrigated farms varied widely; the average acreage in general farms per enterprise ranged from 10 to 480 acres. Deciduous orchards averaged from 10 to 24 acres per enterprise and citrus fruit and avocados from  $6\frac{1}{2}$  to 20 acres. Rice was grown chiefly in two enterprises and it was one of the principal crops in two others. The range in average size of irrigated rice farms was 160 to 600 acres. Many of the projects studied included part-time farms and suburban garden tracts, which averaged from 2 to 10 acres.

### WATER SUPPLY

Most of the enterprises examined obtained their water supplies primarily from surface sources. Only two relied entirely upon the use of ground water. Most diversions were made by gravity although a few were made by pumping from streams or lakes. Storage was widely used to increase available supplies and to prolong the irrigation season. Dependence on storage ranged from cases in which small proportions of the total supplies were held temporarily in small reservoirs to those in which the entire supplies were derived from storage.

The extent to which the water supply met the requirements of lands in the projects varied widely, exclusive of supplemental supplies obtained by individuals by pumping or from other sources.<sup>16</sup> Around three-fifths of the enterprises had supplies of water that were adequate for the needs of currently irrigated land. Two-fifths had deficiencies in supplies that ranged from shortage of late-season water in occasional years to a chronic shortage of water throughout the season.

A shortage of water affects the agriculture of an area in various ways. Commonly a scarcity of water, and especially of late-season water, prevents the raising of crops that require a good deal of water, such as potatoes and sugar beets. It limits production

<sup>16</sup> Pumping of ground water by individuals to supplement available project supplies is practiced in greater or less degree on various irrigation projects. The reports for 11 of the organizations studied disclosed this feature specifically, and it is not unlikely that supplemental pumping was done in other cases.



largely to hay and grain. But where the raising of fruit is possible, the water is used chiefly for orchards, and its scarcity limits the raising of field crops of all kinds.

The proportion of fully adequate water supplies was somewhat higher for the districts that were studied than for the mutual and commercial companies. Many districts were formed to finance storage and other supplemental water supplies for preexisting projects under other types of organization. Also, the Bureau of Reclamation has usually required the district form of organization for projects for which it has developed supplemental water supplies.

### CAPITAL AND FINANCING

The capital of any irrigation enterprise is invested chiefly in its irrigation system, water rights and necessary lands or rights-of-way, and in many instances in land and buildings for office and shops. That is, capital is invested in facilities for developing or diverting, storing, and delivering water to the water users.

Prospective water users often provided the capital for small irrigation enterprises by contributions of cash, materials, and labor in proportion to their several interests. These were private enterprises, owned by the water users, and the irrigation organizations were what are now classified as mutual irrigation companies. Many of these companies began as simple unincorporated associations, some of which have since been incorporated. Others began their existence as corporations. In the incorporated companies, the capital so provided by the water users was represented by shares of the company's capital stock.

The larger projects, however, involved initial costs of construction which exceeded the immediate resources of the water users. These costs were met, partly or wholly, by using capital provided by others. Thus some mutual companies that began with the farmers' own capital and labor subsequently borrowed on bonds or notes, to finance extensions, improvements, and additional water supplies. In other cases, outside investors advanced capital with which to buy land, construct irrigation systems, and sell the land, together with shares of stock in mutual companies; or to build irrigation systems as permanent commercial enterprises. Irrigation districts, with their powers of taxation, came to be used widely for financing irrigation improvements and supplemental water supplies of existing projects, and to a lesser extent for developing entirely new projects. The Bureau of Reclamation deals with water users on the Federal reclamation projects chiefly through irrigation districts.

Sources of capital for irrigation enterprises were private investors, State governments, and various agencies of the Federal Government. Federal credit was particularly important during and after the depression of the 1930's. During the last few decades the resources of private capital proved insufficient in many cases. As a consequence, the Federal Government became increasingly important as a source of financing for large irrigation projects.



No attempt is made to list in this report all the public agencies that loaned money to irrigation enterprises. So far as was ascertained, those that extended credit to organizations in the study are indicated. In addition, the Farmers Home Administration makes loans under the water facilities program to individuals, incorporated mutual companies, and districts, if the prospective borrower meets the standards of eligibility. These loans are made for the purpose of installing or rehabilitating irrigation projects. By statute, the maximum that may be loaned to any one borrower is \$100,000.

#### IRRIGATION DISTRICTS

##### BONDS

Bonds of an irrigation district contain a promise to pay a definite sum on a definite date, with attached interest coupons payable annually or semiannually, usually the latter. The State irrigation-district statutes usually contain provisions relating to interest rates or maximum interest rates, denominations, maturities, and procedure for the sale of bonds.

The security behind assessment bonds of an irrigation district consists of the district's power and duty to levy assessments upon the benefited lands to obtain funds to pay interest and principal as due. If the proper officials neglect or refuse to levy such assessments, bondholders may compel the levy by mandamus proceedings.

Revenue bonds are secured by a pledge of specific revenues, such as those from the service of water or power, and not by the levy of assessments against land. Some irrigation districts have statutory authority to issue either assessment or revenue bonds.

*Extent of bond financing.*—Proceeds from sales of bonds have been the chief source of capital used by irrigation districts for financing construction and acquisition of irrigation systems. A study of such districts (14, pp. 26-39) shows that as of the year 1928, 86 percent of all districts then in operation or constructing facilities had voted bonds and 83 percent had sold part or all of their bond issues. The financing ability of irrigation districts during the several periods of favorable bond markets is indicated by their aggregate experience from 1888 to 1928, when most of the development under this type of organization took place.<sup>17</sup> During that period nearly \$225 million worth of bonds (of a total of nearly \$444 million voted or authorized by 534 irrigation districts) were sold by 442 irrigation districts in 13 of the 17 Western States. This averages about a half million dollars to the district. However, the list of bonded districts includes those only

<sup>17</sup> The 13 States in which the bond-selling districts were located included all of the 17 Western States except Kansas, North Dakota, Oklahoma, and South Dakota, in none of which had bonds of irrigation districts been either voted or sold to December 31, 1928. Heaviest sales of bonds were those of California districts; these sales aggregated about \$109 million, or nearly half of the total. Colorado was second, with about \$26 million, followed by Texas, Idaho, Arizona, Oregon, and Washington, in the order named. As of December 31, 1928, about \$185 million worth of bonds of 381 irrigation districts in these 13 States were outstanding.

partially financed, or financed only partly by bond issues; and the size of bond issues per district and of bonded indebtedness per acre varied considerably.

Twenty-one of the 24 irrigation districts studied issued bonds at one time or another. Fourteen of these districts had bonds outstanding in 1945. Of the 7 others that issued bonds, 5 had paid off their bonded indebtedness and the 2 remaining had refunded their bonds with other obligations. Difficulties of disposing of their bonds were encountered frequently by these districts, but financing was accomplished eventually when markets became favorable. In most cases, bond financing was the primary source of capital. The original bonds of most of the districts were sold for cash to private investors. Some districts, however, exchanged their original bond issues for title to irrigation systems and water rights, and a few sold parts or all of their bond issues to State or Federal agencies.

*The bond market.*—Since the enactment of the Wright Act of California in 1887 and the first sales of bonds of California districts in 1888,<sup>18</sup> the market for irrigation-district bonds has fluctuated. Before the financial panic of 1893, the market for these bonds was fairly strong. This was followed by a period of district failures and a resulting inability to sell bonds except in small quantities and chiefly to local buyers. Around the turn of the century, a market appeared in Chicago and other eastern financial centers, which resulted in the financing of some conservative district developments and subsequently of some promotional ones. The promotional phase reached its climax about 1910 and ended 2 or 3 years later with a second series of district defaults and collapse of the market for this type of bond.

After the second series of district defaults, the chief outlet for those irrigation-district bonds that were sold was in local areas where investors were familiar with the merits of the particular districts. On the whole, development was relatively conservative. District credit gradually improved, with the result that a good many bonds from a number of States were sold before and during World War I. For upward of 10 years following the end of the war, the market for such securities was unprecedented. Many such sales were made to California investors, but the market extended also to the Middle West and East.

During the later 1920's, the market for district bonds, as well as for bonds generally, suffered as investors became interested chiefly in common stocks. The depression of the 1930's led to defaults by many irrigation districts, including a number that previously had paid all their obligations as due. During the middle 1930's, the chief characteristic of district financing was the re-

<sup>18</sup> The first irrigation-district legislation was enacted by the Territory of Utah in 1865, but it made no provision for bond issues. Most districts formed under that law have gone out of existence, and the few that remain resemble present-day irrigation districts very little. The Wright Act of California, enacted in 1887, has served as a model for irrigation-district statutes passed subsequently in all other 17 Western States, including Utah. A brief history of irrigation-district development and financing to the end of 1928 is given in a study of irrigation districts (14, pp. 70-89).



financing of defaulted issues by the Reconstruction Finance Corporation.

Most of the recent irrigation-district financing has related to the refinancing of bonds of established enterprises. However, various districts obtained Government aid during the depression of the 1930's and the period of recovery. One irrigation district studied received from the Public Works Administration a loan secured by district bonds, and a grant to build a storage reservoir that would supplement the water supply of a developed area. The extent to which irrigation districts have developed new projects within the last few years has not been ascertained, but it is not believed to have been substantial.

*State investments in district bonds.*—Funds of several States have been invested in bonds of irrigation districts within their borders. In some of these cases investments were small in proportion to the total amounts of bonds sold by the districts in question; in others they covered the entire bond issues. Some of this financing was done to further irrigation development.<sup>19</sup> Bonds of three of the districts studied were bought by the respective State governments.

#### PROCEEDS OF ASSESSMENT LEVIES

A district, which was organized to supplement the water supply of a settled community already served by six mutual companies, financed its construction program primarily on a "pay-as-you-go" basis, from the proceeds of assessments, supplemented by funds derived from bond sales. This was an unusual situation. The general rule is to obtain construction funds chiefly by borrowing and to repay the loans gradually over a period of years from the proceeds of assessments against the lands.

#### FEDERAL RECLAMATION CONSTRUCTION REPAYMENT CONTRACTS

The Secretary of the Interior was required by the Reclamation Act (24, sec. 4) to fix per-acre charges on lands to be irrigated from each reclamation project "with a view of returning to the reclamation fund the estimated cost of construction of the project." Reimbursement of operation and maintenance costs was not specifically mentioned in the original act. But in 1913 the United States Supreme Court held in *Swigart v. Baker* (229 U. S. 187, 197-199) that it was the intent of Congress, as construed in subsequent statutes, that during the Government-held period, these costs, as well as costs of construction, were to be assessed against the lands benefited.

In administering the reclamation program, the Bureau of Reclamation found it desirable to deal with settlers on each project, from whom it had accepted applications for "water rights," through an organization of the water users. For this purpose a

<sup>19</sup> Investments in district bonds by six States, and experiences in making such investments, to the end of 1928, are discussed in a study of irrigation districts (14, pp. 54-59).



form of organization known as a "water users' association" was devised. This was essentially a mutual irrigation company of a special type; but it was formed under the corporation law of the State, and the settlers held stock in proportion to their irrigable acreages. Distinctive features were appurtenance of stock and "water rights" to the land, and provision that assessments should become liens upon both stock and land. The association was empowered to enter into contractual obligations relating to collection from its stockholders on behalf of the United States of the charges for construction, operation, and maintenance. It was intended that the association would operate the irrigation system when the Government should deem it desirable to turn over operation to the water users. These associations were often quite successful. An example is the Salt River Valley Water Users' Association, which operates the Salt River Project in Arizona.

From the administrative standpoint of the Government, the collection procedure of the water users' association was sometimes unsatisfactory. The only way to collect delinquent charges from a water user was to bring and prosecute an individual action. Owners of lands within the projects for which "water-right" applications had not been made could not be compelled to contribute to the operating costs. A policy then was adopted of urging amendments to the State irrigation-district statutes that would specifically authorize districts to contract with the United States on Federal projects, and of urging replacement of existing water users' associations with irrigation districts. The purpose of this was to permit collection of charges through the district taxing machinery and, with respect to new projects, to replace many contracts with one. The desired amendments were obtained. Today, with comparatively few exceptions (see "Federal reclamation construction repayment contracts" under "Mutual irrigation companies," below) contracts relating to Federal projects are negotiated or renegotiated with district organizations.<sup>20</sup>

The United States financed the original construction of six of the districts studied, in connection with Federal reclamation projects. Four of these districts were formed to succeed water users' associations on such projects. One executed contracts with the United States after having failed to finance its irrigation construction through the sale of bonds. Several others entered into contracts with the United States for supplemental supplies of storage water or for other purposes incident to their irrigation purposes.

<sup>20</sup> The Omnibus Adjustment Act of May 25, 1926 (25, sec. 46) provided that no water should be delivered upon completion of any new project, or new division of a project, until a contract had been made with an irrigation district or districts organized under State law. The Reclamation Project Act of August 4, 1939 (26, sec. 9 (d)) provided that no water should be delivered for irrigation in connection with a new project, new division of a project, or supplemental works until an organization approved by the Secretary of the Interior had entered into a repayment contract. It provided also (26, sec. 2 (g)) that the term "organization," as used in the act, should mean any conservancy district, irrigation district, water users' association, or other organization, organized under State law and having the requisite contractual capacity.

## REFINANCING

Various irrigation districts had refunded their original bond issues before the depression of the 1930's. Some, and possibly most, of these refundings were made in the course of debt adjustments with creditors, following defaults (11).

The depression of the 1930's caused many districts to default upon their obligations. Many others applied to the Reconstruction Finance Corporation for refinancing loans. All of these applications were not granted, but the Reconstruction Finance Corporation had a large part in the history of irrigation-district refinancing. Of the 15 districts in the present study that completed refinancing programs, 10 were able to refund their outstanding bonded indebtedness through loans from the Reconstruction Finance Corporation and thereby to improve substantially their financial positions. Reductions of capital indebtedness so effected were considerable; the prices at which the old bonds were retired ranged from about 40 to 75 cents on the dollar. In addition, the interest rate was reduced in all the cases studied, usually from 6 to 4 percent. Usually the refunding bonds were issued directly to the Reconstruction Finance Corporation, which sold many of them to private investors. Since they were refinanced by the Reconstruction Finance Corporation, several districts have obtained even cheaper money from private sources for refunding and other purposes. Some of them have obtained loans with interest of 3 percent or less.

Five of the districts studied refinanced without loans from the Reconstruction Finance Corporation. The refundings were made with loans from private, Federal, or State sources.

## DEFAULTS

The depression that followed the financial crisis of 1929 resulted in defaults by many districts that had previously maintained their credit. A canvass of all irrigation districts in the Western States made in 1929 (14, pp. 39-43) showed that for all bonds sold through 1928, 71 percent were in good standing, that is, all interest and principal had been paid as due. But information obtained then and shortly thereafter indicated that new defaults were developing and that the percentage of bonds in good standing was about to be sharply reduced. For several years thereafter, the aggregate number of districts in default mounted steadily.

Of 21 irrigation districts studied that issued bonds, 13 defaulted; 8 have made all payments of principal and interest as due. Three had defaulted at one time or another on payments due the United States under construction contracts. Others apparently made all of their payments under United States contracts as due, except for those deferred by reason of moratoria.

The position of most of the districts that had been in trouble 10 years earlier had improved when the canvass for the study reported upon here was made in 1946 and 1947. Most districts were then reported to be paying their current obligations as due.



Three were reported in default on bond payments and one on payments due under a construction contract with the United States. Three districts, all of which had previously defaulted and had been refinanced on favorable terms, have since retired bonds ahead of schedule, in some cases at premiums. Another, also previously in default and refinanced, has set up a sinking fund to retire a bond series of \$2,000,000 in 1959, although it is not due until 1986.

#### OTHER DISTRICTS

Of the districts studied, those that were organized under State laws other than irrigation-district statutes typify several methods of financing.

The Arizona electrical district and the California water district were financed wholly by private capital. The electrical district sold bonds to finance the construction of a power-distribution system that would enable landowners to pump water individually for irrigation. Bonds were made payable from collections of taxes.

The water district traded revenue bonds to a public-utility irrigation company for a part of the irrigation system of the latter, and refunded these bonds with an issue that sold readily to the public. All revenues from the sale of water for irrigation were pledged to secure payment of principal and interest of the bonds. The bondholders cannot compel the exercise of the taxing power for this purpose.

The Colorado water conservancy district is the agency contracting with the Bureau of Reclamation to repay the construction costs, allocated to irrigation, of a large multiple-purpose project.

Several public power and irrigation districts, which are important in Nebraska, were organized after the enabling act was passed in 1933. These districts sold bonds in large numbers. Of those districts in the present study and those associated with such districts, by far the larger part of the total investment was for purposes of power. These are revenue bonds only, as public power and irrigation districts do not have the taxing power. Loans secured by revenue bonds, and grants, were obtained from the Public Works Administration. The irrigation division of one of these districts was partly financed by advances from an associated district organized for power purposes alone, which had sold all of its bonds to private investors. However, the amount of this loan in relation to the amount of the bonds sold by the creditor district amounted to only about one-fourth of 1 percent.

#### INCORPORATED MUTUAL IRRIGATION COMPANIES

All of the mutual companies studied were incorporated. All except one were in good standing and were exercising their corporate privileges. The affairs of the one exception—a former corporation in Utah that had lost its corporate standing—were administered by a voluntary association of water users pending reincorporation.



## CAPITAL STOCK

Most incorporated mutual irrigation companies have shares of capital stock, held chiefly or entirely by the water users. In some cases, some of the shares are still held by the land companies that constructed the projects. Only one, a mutual company in Wyoming, was a nonstock corporation.

The number of shares of stock outstanding ranged from 40 to 100 percent of the number authorized by the articles of incorporation. In most cases, it was more than 80 percent. Several companies held some treasury stock, or rented out shares that had never been sold.<sup>21</sup>

*What shares of capital stock represent.*—As is the case with a commercial irrigation company (or any other private corporation), the capital stock of a mutual irrigation company represents ownership of the corporate assets. Hence a water user who owns shares of stock in the mutual company that serves him (as most of them do) is part owner of the irrigation system from which he gets his supply of water. But in contrast to the commercial irrigation company, a share of capital stock of a mutual company also represents the right to the service of water from the company's system. A shareholder pays for this service through stock assessments or toll charges, or both.

*Relation of shares of stock to land.*—Shares of stock of a mutual company may or may not be attached to specific tracts of land. They may be attached to land either by way of "location" upon specific tracts, resulting from contract between company and shareholders evidenced by articles of incorporation, bylaws, and stock certificates, or by representing the right to receive water considered appurtenant to such tracts. In California, mutual companies may attach their shares to specific tracts of land either by making them appurtenant under a special statutory procedure or by locating them upon land without following the statute (16, pp. 67-69). If not attached to specific tracts, they are known as "floating" shares. These floating shares may pass freely from one holder to another and may be used for irrigation of any tract that can be served from the system as normally operated. Restrictions are sometimes imposed by the management upon the transfer of water from one lateral to another, based upon capacities of distributaries and requirements of operation. This, however, is a matter of operation and management that is within the discretion of the directors, and within such limitations the shares are freely transferable.

Shares of mutual-company stock attached to specific tracts of land show the designation of the tracts on the face of the stock certificates. Shares of 10 of the companies in the present study were so located, or they represented the right to receive appurtenant water. But the shares of 4 of these organizations were

<sup>21</sup> "Treasury stock" is stock that has been issued as fully paid and that subsequently has been reacquired by the corporation, but not retired, cancelled, or restored to the status of unissued shares: Ballantine (2, p. 614, sec. 260). Mutual irrigation companies usually reacquire their own shares of stock through sales or forfeiture for delinquent assessments.

reported as subject to transfer to other tracts, with the consent of the board of directors.

In many cases in which shares of stock are attached to land, the ratio of shares to irrigable acres is uniform. The ratio of floating shares to land areas varies widely, not only from one company to another, but within a particular company. In many cases it depends upon the individual needs of the water users for water and upon their several financial circumstances.

*Stock values.*—The par value of a share of stock is a fixed factor of the total capitalization. It is derived from the total capitalization and the total number of shares. In mutual-company finance, the par value of stock is of secondary importance as compared with the market value. The par value of stock of the mutual companies studied ranged from \$1 to \$30 a share; in most cases it was \$10 a share.

The market value of floating, or nonappurtenant stock, which is the price at which it changes hands from user to user, is related very little or not at all to the par value. A share of mutual-company stock obviously can have a market value only when it is marketable. It is marketable only when it can be sold and transferred separately from the land on which the water has been used. Hence shares that are attached to specific tracts of land, and cannot be transferred to other land, have no separate market value. Although it is real enough, their value is merged with the market value of the land. The par value of stock of one company studied was \$25, but during a period of years the market value ranged from \$60 to \$150 a share. In another case, although the par value was only \$30 a share, in 1931 the market value was \$265 and during 1946 it ranged from \$675 to \$900. The market value of floating stock of a mutual company at any given time is determined chiefly by the net prices received or expected to be received from farm products and the state of the company's water supply in relation to the seasonal rainfall (16, pp. 59-65).

*Shareholders.*—Mutual irrigation companies having stock attached to specific parcels of land usually provide that holders of shares shall be owners of land in the service area, or shall hold water rights, or both. In the case of floating stock of the companies examined, no qualifications were prescribed. In some companies, shares are not transferred on the books to persons who fail to present evidence of ownership of land within a defined area. In other cases, shares are transferred on the company's books to any purchaser, but the service area of the company is defined and water is not delivered outside that area regardless of ownership of the shares. Cases of monopoly of floating stock of mutual companies for speculation appear to have been rare (16, pp. 69-71). Personal qualifications for ownership of shares of stock of mutual companies are rarely specified, although some companies prescribe qualifications as to citizenship.

The largest mutual irrigation company with respect to irrigated acreage had the largest number of shareholders, and the smallest company had the smallest number. For the other companies



studied, no correlation was found between total acreage and total number of shareholders.

#### BONDS

Bonds of mutual irrigation companies are secured by a mortgage upon the irrigation system, water rights, and all other property of the company. They are not secured by the land served, unless this is individually provided for by the stockholders of the company or unless assessments against the capital stock are made a lien upon shareholders' lands as well as upon the stock. Irrigated lands are made liable in case of nonpayment of mutual-company indebtedness by some mutual companies but this is not characteristic of these enterprises as a whole. (See discussion of mutual-company stock assessments, p. 43.)

Comparatively few mutual irrigation companies issued bonds at the time they were organized. As previously indicated, the assets of the company are the security for such bonds. This is in contrast to the bonds of irrigation districts which are secured by assessments against the included lands and the legal obligation of the districts to levy such assessments. Hence, a mutual company organized for the purpose of building a new irrigation system ordinarily has no security to offer for bonds issued to obtain funds for constructing the system. Original construction of mutual-company works was financed chiefly by capital provided by promoters who built the systems and who expected to be reimbursed through sales of "water rights" or of land with stock or contract rights attached, through the individual means and labor of the settlers themselves, or by capital from other sources. Some companies that were promoted paid something when they took title to the irrigation systems, although many paid nothing. Bond issues of mutual companies usually came later. They were for improvements and extensions of the irrigation systems and for acquisition of supplemental water supplies.

*Indications of extent of bond financing.*—Complete data on sales of bonds of all mutual irrigation companies are not available. However, studies of certain groups of such companies indicate that bonds are less important in mutual-company financing than in financing irrigation districts; that the aggregate bond financing of mutual companies has not been comparable with that of irrigation districts; and that many incorporated mutual companies have not issued bonds. The results of three such studies are as follows:

A study of mutual irrigation companies published in 1929 (10, p. 23), which did not purport to be a complete canvass, reported that about 17 million dollars' worth of bonds had been disposed of from time to time by 53 operating mutual companies, or a round average of \$320,000 per company. However, about 6½ million dollars' worth of these bonds had been issued by one organization, thus reducing the average for the remaining 52 enterprises to about \$202,000. Of the total 17 million dollars, only about 1 million was issued for entirely new development.

Another study, made in 1935 (16, pp. 78-79), of 122 selected mutual companies—36 were in northern California, 48 in southern



California, and 38 in Utah—disclosed that at the beginning of 1935, two northern California companies had a total of \$126,500 worth of bonds outstanding, or an average of \$63,250 per company; 18 southern California companies had a total of \$4,731,000, or an average of about \$262,800; and 5 Utah companies had \$492,000, or an average of \$98,400.<sup>22</sup> This study included practically all of the larger mutual companies in southern and many in northern California. The bonded mutual companies of both California and Utah were probably well represented.

Nine of the 17 mutual companies in the present study issued bonds at one time or another. Most of these companies issued their bonds for improving, extending, or completing the irrigation systems they had acquired or for the purchase of supplemental storage supplies. In 1945, five of them had outstanding bonds that aggregated \$261,000, or an average of \$52,200 per company.

*Availability of bond markets.*—Markets for bonds of mutual irrigation companies, as contrasted with those for irrigation-district bonds, were relatively local. The mutual bonds were handled chiefly in a few western financial centers, of which Los Angeles was one. Many of these issues were those of companies within the general region of the investment center, where the characteristics and capabilities of the enterprises seeking credit were understood. Apparently this type of investment is not well known in the East, except by eastern clients of western bond houses.

For many decades, the citrus industry has been outstanding in the agricultural economy of southern California; it represents a very large aggregate investment. Mutual water companies have prevailed in areas devoted primarily to production of citrus, as well as in areas having other types of agriculture. On the whole, these companies are well managed. Water is relatively scarce and of high value. The large investments per acre in water supplies and works, as well as in other features of agricultural production, and the necessity for efficient distribution of water with the lowest practical loss, call for a high type of management. With few exceptions, these mutual companies have had good records in the repayment of their obligations. As a result, the bonds of many have been marketable in nearby Los Angeles, where the companies are known and where many wealthy persons have made investments. At one time it was reported that the bonds of southern California mutual companies not only compared favorably with irrigation-district bonds on the Los Angeles market, but that they were preferred by many investors.

From time to time, markets have been available for the bonds of various mutual companies located in areas served by such financial centers as Spokane and Denver. Considering the West

---

<sup>22</sup> Bonds of several companies were refinanced during 1935 at lower rates of interest, and the principal of two was reduced. Several Utah companies were indebted to the Federal Government through a water users' association for the purchase of reservoir water. One Utah company had sold \$500,000 worth of bonds in Denver about 1911 in order to build a power plant. Later it sold the power plant and bought back the bonds.

as a whole, however, markets for mutual-company bonds have been narrower than markets for bonds of irrigation districts.

#### OTHER SOURCES OF FINANCING

Some mutual companies have borrowed substantial sums for capital expenditures from banks or other sources. Others have seldom had outstanding indebtedness for more than short periods. Some companies commonly borrow on short-time loans to pay operation and maintenance charges, pending collection of assessments.

#### FEDERAL RECLAMATION CONSTRUCTION REPAYMENT CONTRACTS

The Federal Government originally contracted with private water users' associations for repayment of the costs of construction of reclamation projects and of annual costs of operation and maintenance. Experience, however, led to preference for the irrigation-district form of organization. Most of such contracts on reclamation projects are now with irrigation districts. But some of the contracting parties are water users' associations, which are essentially mutual irrigation companies of a special type.

The Salt River Valley Water Users' Association on the Salt River Project in Arizona is one of the few that have retained their original form of organization.

Utah water users favor the mutual-company type of organization, which has been characteristic of that State from early stages of irrigation development. Unfortunate experiences with several irrigation districts formed shortly after World War I strengthened this preference. Because of the strong feeling in that State the Bureau of Reclamation has made some exceptions to its policy, and has executed contracts with water users' associations with respect to several reclamation projects in Utah even fairly recently. Local mutual companies have obtained the benefits of such projects by acquiring stock in these associations.

#### REFINANCING

Obligations of various mutual companies have been refinanced either through private or through public agencies.

Banks for cooperatives of the Farm Credit Administration are authorized to make loans to those mutual irrigation companies that meet the eligibility requirements of law for borrowers from such banks. A number of mutual companies in several States were refinanced in this way, dollar for dollar, on terms more favorable than the general markets afforded. For example, the bonds of two California companies, both of which had excellent financial standing, were refunded at par with loans from a bank for co-operatives. Interest rates were reduced from  $6\frac{1}{2}$  and 6 percent to  $3\frac{1}{2}$  percent.

The Reconstruction Finance Corporation also has refinanced the obligations of a number of mutual companies in various Western States, including two of those studied.

## DEFAULTS

Reports for 11 of the 17 mutual companies in the present study indicate that they have not defaulted upon any of their obligations. Four of these 11 companies had issued bonds. Of the other 6 companies, 2 had defaulted temporarily at various times, but had eventually made up all past-due obligations. In one case, bondholders had agreed to a 3-year extension. In the 3 remaining companies, creditors took substantial losses as a result of the defaults.

## UNINCORPORATED IRRIGATION ASSOCIATIONS

Usually members of an unincorporated irrigation association who borrow money for purposes of the association are individually and collectively obligated. The elements of corporate financing are lacking. For example, the making of improvements considered desirable by most of the members may be blocked by a few. If these few did not assent to the making of the improvements either when the association was organized or subsequently, they cannot be compelled to contribute to the cost. Nor can they be forced to contribute to the cost of improvements that are not essential to the successful operation of the enterprise.

## COMMERCIAL IRRIGATION COMPANIES

Most commercial enterprises were originally financed through capital invested by promoters who expected to derive profits from the sale of land or water, or both. The capital so advanced was chiefly represented by capital stock of the companies and, in many cases, by bonds issued by them. Additional funds for further construction work were obtained in various cases through the sale of lands and "water rights" to settlers.

All of the commercial companies in the present study were incorporated. The reports for half of these companies state that they were incorporated under the corporation laws of the States in which they operated. This probably holds true for the others also.

## CAPITAL STOCK

*Characteristics of commercial-company capital stock.*—The capital stock of incorporated commercial irrigation companies represents ownership of the corporate assets, as does that of mutual irrigation companies or other corporations. However, a share of stock of a commercial company does not represent a right to the service of water, as does a share of mutual-company stock. That right vests in the public within the area served by the company if it is a public utility, and otherwise in the holders of "water-right" deeds or contracts entered into by the company on a private-contract basis. (See under "Water Service," below.)

All shares of stock of each commercial company for which data regarding capital stock were reported were of one class. At one time one company had issued cumulative preferred stock in exchange for maturing notes, but it had retired the preferred stock with the proceeds of sale of parts of the irrigation system.



Several companies had not issued all of their authorized shares of stock, but in only one of the cases reported was the number of outstanding shares less than 60 percent of the amount authorized. At least two companies held some treasury stock.

Par values of shares of stock in all except two cases were \$100 a share; the exceptions were \$50 and \$10. Apparently the demand for shares of these enterprises was slight or nonexistent. The question as to market value was answered for only three companies. Two of the answers were "none" and the third was "no sale."

Outstanding shares of one company, with a par value of \$100 a share and market value not reported, had been assessed from time to time in an aggregate sum of \$52 a share. No dividends were paid in any year. Stock assessments were not reported for the other commercial companies studied.

*Holdings of shares of stock.*—Regardless of the number of individual shareholders, control of the stock of the commercial companies in the present study was vested chiefly in small groups. For example, of 94 holders of one company's shares, 5 held 88 percent of the total number of shares. There were 6 holders of the 3,000 outstanding shares of another company: Four officers of the company held one share each, and the remaining 2,996 shares were equally divided between an individual and an estate. Again, a small company had about 25 shareholders, but the controlling interest was owned by the president and his family. Shares of one of the larger companies were held in 15 names; one holding was 57 percent of the total, and the four largest aggregated 81 percent. Shares of a Nebraska company that is considered locally to be practically a community enterprise, even though operated on a commercial basis, are owned by a few local landowners, water users, and businessmen in a neighboring town.

*Capital stock dividends.*—In view of the history of commercial irrigation companies generally, it seems improbable that many of them paid substantial dividends after the close of their development periods. The records of the California Railroad Commission (now the Public Utilities Commission) show that from 1913 to 1926, an average of 61 public utilities which derived 25 percent or more of their total water revenue from sales for irrigation, made reports to the commission. Of these, from 2 to 5 each year, or an average of 4 paid dividends annually. The ratio of total dividends to total capital stock of these companies averaged 3.82 percent (12, pp. 9-10 and 36-38). In other States, also, it is probable that a commercial irrigation company which pays dividends consistently is an exception.

Dividends on capital stock are reported to have been paid at one time or another by four of the commercial companies examined. In one case, dividends were paid on preferred stock only—the only instance in which issuance of preferred stock was reported. In another case, the first dividend since World War I had just been paid. In still another, dividends of 3 and 3.33 percent were paid in 1944 and 1945 respectively, but from 1929 to 1943,

inclusive, none were paid. In the fourth case, small dividends had been paid in most years of the decade ending in 1945. Another company was allowed a return of 6 percent on its investment in a rate case, from which it may be inferred that dividends were paid in at least some years. This record of dividend payments may not be complete, particularly in view of the fact that some commercial companies were unwilling to disclose their financial transactions in full. However, the situation with respect to these companies does not seem far out of line with respect to the experience of commercial companies generally.

#### BONDS

It is evident that bonds were issued and sold on a considerable scale to finance construction of commercial irrigation projects. At least four of the commercial companies studied issued bonds at one time or another; in three of these cases all bonds and other funded obligations have been retired, chiefly, it appeared, through the sale of capital assets.

#### METHODS OF FINANCING

*Construction or development companies.*—During the latter part of the 19th century stocks and bonds were sold widely to finance both irrigation projects and land- and water-development projects on a commercial scale. During part of this time, there was an active market in Scotland and England for such securities. Much of the early irrigation development in Colorado that is now under the mutual-company form of organization was financed commercially with British capital (19, p. 11). Construction of the system of a large Utah commercial company was begun in 1889 with the proceeds of sales of bonds, many of which were marketed in Great Britain (20, pp. 207–208). Projects constructed under the Carey Act, passed by Congress in 1894, were financed and built chiefly during the first decade of the present century (6, chiefly pp. 3, 6–7; 18; 19, p. 157). After 1913, a series of defaults of both commercial and district enterprises destroyed the market for bond issues of these companies and few were sold. The market for commercial-company bonds did not revive thereafter as did that for bonds of irrigation districts.

These development-company bonds were secured by first mortgages upon works to be constructed and by deposits of settlers' purchase-money contracts for rights to water or for lands and attached rights. Deferred payments on contracts were secured in turn by first liens upon private lands or, in the case of reclamation of public lands, upon the settlers' equities therein. However, many landowners refused to buy "water rights" promptly, if at all, and the companies could not compel them to do so. In the case of Carey Act projects, no direct lien on the public land could be obtained in advance of construction of the system and availability of a permanent water supply. This made the security for preconstruction bonds of development companies wholly dependent upon future circumstances.

Adequate realizable security for obligations of irrigation enter-



prises depends upon the ability of the lands to pay the charges made by the enterprises for water service. This ability does not materialize unless and until the lands have been developed, irrigated, and brought into production. Actually the selling of irrigable lands was seriously delayed, as were colonization and development of both private and public lands. Because of these delays the obligations of many development companies began to fall due before they could be met. The troubles common to irrigation enterprises of all types were also present. For these reasons, defaults were heavy on bonds of commercial water companies, land and water companies, and Carey Act construction companies. Teele says (19, pp. 148 and 157) that almost without exception, enterprises in the first two groups were failures, and that a large part of the money invested in Carey Act bonds was lost. Substantial profits may possibly have been made by some who put their own capital into land subdivisions and canal construction and waited for the expected returns. But in many such cases the waits were long, and this meant loss of interest if not of principal. It is believed that not many bond issues for this general purpose were paid in full; and it is known that much capital invested in enterprises of this type was lost.

*Private-contract companies.*—Returns on investments in private-contract companies were subject to the same hazards as those on investments in development companies and they were affected in the same way by delays in selling irrigable lands. Many of these companies operated under contracts that carried fixed annual charges for operation and maintenance, which eventually proved to be too low. Investments in these enterprises were generally unsatisfactory. Some such companies still function but most of these systems were transferred to the water users organized as districts or mutual companies. In some cases this was done at reasonable compensation; in others practically as a gift. For many years very little market has existed for the securities of private-contract companies. It is doubtful whether there is now any market for them.

*Public-utility companies.*—In the last few decades, bonds of a few public-utility irrigation enterprises in several States, though principally in California, were sold from time to time. Some public-utility irrigation enterprises originated as such. Some that were intended to be private-contract companies were declared by courts to be engaged in public service and subject to public regulation of their rates and services. Of these companies, those that have substantial markets for water to be used for domestic and industrial purposes, generally speaking, are in better position to market bonds than those whose water market is primarily for irrigation. In the aggregate, sales of bonds of established commercial enterprises are believed to have been small in the last two or three decades.

#### CURRENT FINANCIAL STATUS

None of the commercial organizations studied was reported currently in default. Although the predecessors of some existing



companies had serious or even fatal financial difficulties, none of those now in existence was reported as having failed to pay its obligations in full eventually, and only one was said to have been slow in making payments at times.

## REVENUE

### IRRIGATION DISTRICTS

Irrigation districts obtain their revenues chiefly from assessments against land. Revenue may be obtained also under the district laws of many Western States through tolls charged for use of water, either in addition to assessments or in lieu of them. Tolls are an important source of revenue for many irrigation districts in these States.

### ASSESSMENTS AGAINST LANDS

Standard irrigation districts have power to levy assessments against lands included within their boundaries and benefited from the irrigation improvements. Assessments must be levied strictly according to prescribed statutory procedures. When levied the assessment becomes a lien against the land; if it is not paid, the lien is subject to foreclosure and the land is sold at tax sale.

Irrigation-district assessments are levied annually, chiefly to raise money to pay the principal and interest on bonds, to make payments due to the United States under contract, to take care of other authorized obligations, and to pay maintenance, operation, and other current expenses. Some statutes provide for assessments to complete works of the district in case the necessary funds are not forthcoming from the sale of bonds. Special assessments are specifically authorized by the statutes of several States, although they are usually subject to prior authorization at a district election.

*Methods of apportioning assessments.*—The principal methods of apportioning assessments are: (1) Uniform rate per acre, (2) ad valorem, or according to the full cash value of the land, either including or excluding improvements, computed annually, and (3) according to the benefits derived from district improvements which in some States are apportioned once with respect to each authorization of bonds, and in others are apportioned annually. The statutes of a number of States provide that in case of payments due under a contract with the United States, assessments shall conform to the contract and to applicable Federal laws. For all other purposes, in some States an exclusive method of apportionment is prescribed, and in the remainder a selection from two or more methods is authorized by the statute.

*Procedure for levying and collecting assessments.*—The board of directors of the district makes the levy, or determines the amount to be included in the general levy made annually by the county governing board, depending upon the statute (13, pp. 55-59; 14, pp. 20-26).

Collections of district assessments in the larger number of the Western States are made by county tax collectors at the same time

as the general tax collections. In some the county treasurer is ex-officio district treasurer. The statutes of the remaining States provide either that the district shall have its own tax-collection procedure entirely independent of the county, or that districts of certain classes or under certain circumstances may elect to make their own tax collections or to utilize the services of county tax officials. Even in States in which collections are made by county tax collectors at the same time and in the same way as general taxes, the statutes sometimes provide that district and general taxes may be collected separately, that is, that receipt of one does not depend upon payment of the other at the same time.

Statutes that govern assessment procedures for general and district taxes specify when the levies shall be made, when the assessments become liens upon the land assessed, when they are payable, and when delinquent. They provide for publication of delinquent lists, for sale of land for the delinquent assessment, and for the period of redemption. Several irrigation-district statutes provide for payment of annual assessments in installments. The periods of time that elapse, or that may elapse, between the date of the levy and the final date at which redemption may be made vary from State to State. In all cases the time is considerable; in some, it may cover years. Collection of an assessment from an unwilling landowner, who nevertheless will go to any length to prevent ultimate loss of title to his land, is a long, slow process.

*Taxation of nonfarm land.*—Statutory authority to include urban land in irrigation districts and to levy assessments against it for district purposes exists in a few States, and is limited or prohibited in a few others (13, pp. 59-60). For example, in the irrigation-district law of California, land subject to district taxation includes city and town lots, but excepts improvements (which specifically include trees, vines, alfalfa and other growing crops, and buildings and structures). In Texas, municipalities may be included in districts under certain circumstances. Irrigation districts in Nebraska may assess city and town lots, except while they are occupied and used exclusively for other than agricultural purposes.

#### TOLLS

The statutes of various States authorize the obtaining of revenue through tolls or charges for use of water. These tolls or charges are fixed by the board of directors, either in addition to the levying of assessments or in lieu thereof. They are collected by the district secretary or district treasurer. Some statutes provide that tolls may be made payable in advance of the delivery of water.

The basis for toll charges varies considerably among districts that use this method of obtaining revenue. For example, two districts studied charged uniform rates per acre, and two charged uniform rates per unit of water delivered. In two other cases, payment of the operation and maintenance assessment entitled landowners to use a minimum quantity of water. Excess quantities were charged for by tolls at uniform rates. Other methods in-

cluded systems of charges based upon quantity of water and method of delivery with the rates varying according to the delivery method selected by the water user; and flat rates per acre applied to all lands entitled to water service whether or not irrigated, and an additional charge per acre for each irrigation against farmers who actually use the water.

#### REVENUE FROM SERVICE OF WATER TO LANDS OUTSIDE BOUNDARIES

Irrigation districts in various Western States have statutory authority to rent or lease water to lands outside their boundaries. This authorization generally applies only to water not needed by district landowners. In some cases, it is further limited to short-term services and by the provision that no vested right to such service may be acquired thereby.

Several of the irrigation districts studied were reported as delivering water to outside lands under annual rentals or other temporary arrangements, although in no case were these operations of great importance. Two districts supplied water to outside or excluded lands under contracts with the United States. In other instances outside deliveries were made under circumstances peculiar to the local enterprises.

#### USE OF ASSESSMENTS AND TOLLS

Tolls are used by many California districts, usually in addition to assessments (1, table II, pp. 392-393). They are used to a lesser extent in some of the other Western States.

Of the irrigation districts studied, 15 derive their revenue chiefly from assessments, without the use of toll charges.<sup>23</sup> Fourteen of these levied assessments for operation and maintenance. Eight also levied assessments for payment of bonds and interest, and three for payments due under construction or storage contracts with the United States.

Eight districts, all of which had outstanding indebtedness represented by bonds or contracts with the United States, combined the use of assessments and toll charges. One used both assessments and tolls to service both debt and operating charges. The other seven were paying their bonded debts from the proceeds of assessments; of this group, four raised money for operation and maintenance from tolls and three from both assessments and tolls.

One irrigation district in California relied entirely upon toll charges for the use of water to cover expenses for operation and maintenance and for bond service as well. As rice was the only major crop grown in the district, this method was preferred because of the large area of rice land idle each year. But the power to assess the land is available in case the toll system proves inadequate to meet the district's financial requirements.

A number of districts in California assess nonfarm land, including business property of high value, for indirect benefits. Others

<sup>23</sup> Some districts obtained additional revenue from sales of water to towns or industrial concerns, or for deliveries of water under contractual arrangements.



exclude such areas. For example, one district studied taxed about 80 acres of town lots, the assessed valuations of which ranged from \$400 to \$3,000 an acre, whereas the valuations of irrigable land ranged from \$140 to \$300 an acre (lands actually using water paid toll charges also). A Texas district assessed all property, real and personal, on an ad valorem basis for bond retirement, and in addition made a flat charge per acre against irrigable lands and an acre-irrigation charge for actual use of water. A Nebraska district assessed about 100 acres of city lots on which water was used for gardens, lawns, and shade trees, at average valuations corresponding to farm lands of high-valuation classes (plus toll charges, at the same rate per lot of less than 1 acre as for an acre of farm land). It excluded business blocks and other commercial properties within the municipality.

#### ENFORCEMENT OF PAYMENT OF ASSESSMENTS AND TOLLS

The conventional method of enforcing the payment of delinquent assessments is by tax sale. In addition, the right to refuse delivery of water to lands for which assessments are delinquent is accorded by the statutes of some States. In certain of these States, water may be withheld if payments are delinquent at all; in others, only if the delinquency has existed for a prescribed time, perhaps 1 or 2 years. In California, when an assessment has become delinquent, the board may direct the district collector not to proceed with the sale of delinquent property but to bring suit in the proper court to enforce collection (§, sec. 26081). The general-taxation statutes, or the district statutes, as the case may be, make provision for interest and penalties against delinquent lands.

Some statutes that authorize the imposition of toll charges provide that water may be refused to lands for which toll charges are delinquent. Some authorize or direct the adding of unpaid tolls to assessments against such lands. Delinquent toll charges are subject to interest and penalties.

#### OTHER DISTRICTS

The Arizona electrical district levied assessments for its several purposes.

The California water district had statutory authority to issue either bonds payable from the proceeds of assessments against land, or revenue bonds payable only from income from sale of water for irrigation of district lands. It elected to issue the revenue bonds. All collections of charges for water service are pledged to secure payment of the bonds. The district still can levy assessments for operation and maintenance should it become necessary to do so.

When its project is completed, the Colorado water conservancy district will obtain its revenue from two principal sources: (1) A general property tax against all taxable property, both real and personal, within its boundaries; and (2) special benefit assessments against the lands for which the owners have contracted with the district to receive water. These assessments will provide the

major share of the district's revenue. The purpose of the general-property tax is to enable the district to obtain some contribution from urban groups and other indirect beneficiaries of the project.

Among the latter, for example, are a large number of irrigators whose direct-flow rights will be enhanced by the return flow of project water applied to upstream lands. These irrigators consented to be included in the district and to pay the small property tax in return for the indirect benefits they hope to receive. The property tax is limited by statute to a very low rate. The amount of the special-benefit assessment is limited by the rate per acre-foot of water fixed in the contracts between the landowners and the district. These contracts must contain a stipulation that the assessments shall become a perpetual tax lien against the land covered by each contract. Both the general-property tax and the special assessments are collected by county officials, along with other local and State taxes.

The Nebraska public power and irrigation districts have no powers of taxation; all of their revenue is derived from the sale of water or power. Both districts have permanent contracts with water users which provide for the sale of water. The revenue from this is applied to debt service and to operation and maintenance. One district took over the system of a commercial irrigation company and thereby inherited a multiplicity of water services, including permanent contracts of various kinds and temporary rentals.

## INCORPORATED MUTUAL IRRIGATION COMPANIES

### ASSESSMENTS AGAINST SHARES OF CAPITAL STOCK

An incorporated mutual irrigation company which has shares of capital stock, as most of them have, usually derives its revenue chiefly from assessments against the shares. The company must have legal authority to assess its fully paid shares, and ordinarily it has that authority. Basically, this authority is accorded by the State corporation law under which the company is organized, but in some States the power to assess fully paid shares must be expressed also in the articles of incorporation, or the bylaws. In some cases, it must be stated on the face of the stock certificate. Assessments may be levied only to the extent provided. When levied, the assessment becomes a lien upon the shares.

*Procedure for levying and collecting assessments.*—The procedure governing the levy and collection of assessments against shares of stock depends upon the State corporation law. This law may set up a detailed procedure that must be followed; or it may prescribe a procedure that applies unless the corporation has provided otherwise through some means authorized by law, such as the articles of incorporation, the bylaws, or a stock-subscription agreement. The speed with which a company may proceed to collect its assessments and sell its delinquent shares varies in different jurisdictions, but the minimum time that must elapse be-

tween the date of levy and the date of sale is reckoned in months instead of years.

The assessment procedure is administered wholly by the appropriate company officers. They make the order of levy, serve notice of the assessment upon the stockholders, publish the notice if required by law,<sup>24</sup> and receive payment at the appointed time and place. If an assessment is not paid, the officers declare the shares delinquent on the date fixed in the order; and on the date fixed, they may sell at public auction the number of delinquent shares necessary to pay the assessment and costs. If there is no bidder, the delinquent shares may be forfeited to the corporation or bid in by officers of the company, depending upon the statutory procedure that governs.

In some jurisdictions mutual companies, in lieu of selling delinquent shares, may bring suit to collect delinquent assessments.

Withholding water from delinquent shareholders is apparently rather widespread in various States (10, pp. 28-29). In some jurisdictions it is recognized as a lawful remedy. However, in at least one such case, as a result of a court decision, the company was allowed to withhold water for nonpayment of maintenance assessments for the current year only and not for payment of past-due assessments. Eight of the mutual companies studied reported that no water was delivered to lands of delinquents.

*Lien of assessment.*—Ordinarily a mutual company has a lien only on the delinquent shares and not on the irrigated or irrigable land. However, liens on stocked land were provided in the case of companies that originated as Carey Act enterprises. This was characteristic also of the water users' associations formed on Federal reclamation projects; and it has been the case with some other mutual companies (10, p. 27; 16, p. 152).<sup>25</sup> The land liens of these particular mutuals, as distinguished from land-tax liens, arose by contract between the companies and their stock subscribers. In these cases, the companies have recourse against the land as well as against the delinquent shares.

*Frequency of assessment levies.*—Mutual companies may levy one or more assessments each season, as their needs dictate, unless restricted by statute or by their own organizational framework. Usually these companies can select the time or times of making their assessment collections by making the levy the required number of days in advance of the collection date fixed in the resolution or order of levy.

*Extent of use of stock assessments.*—Assessments against shares

<sup>24</sup> The general corporation law of Utah (28, sec. 18-4-10), which sets up a detailed procedure for levying and collecting assessments that applies unless otherwise provided in the articles, bylaws, or stock-subscription agreement, provides that corporations formed for irrigation purposes may omit publication of the notice of assessment.

<sup>25</sup> Assessments of Salt River Valley Water Users' Association, Arizona, whose articles of incorporation provide that its stock shall be inseparably appurtenant to the land and that assessments shall be a lien on the land, were held in *Greene & Griffin Real Estate & Investment Co. v. Salt River Valley Water Users' Assn.*, 25 Ariz. 354, 359, 360-362, 217 Pac. 945 (1923), to be liens superior to prior mortgage liens.



of capital stock are very generally made by incorporated mutual irrigation companies. This feature was disclosed by a study of mutual companies in California and Utah published in 1936 (16, p. 147). Fourteen of the sixteen mutual companies in the present study that had shares of capital stock assessed the shares each year to defray all or part of their costs of operation and maintenance, overhead, and current indebtedness. Eight of the companies that issued bonds, at one time or another assessed the shares of capital stock to pay the principal and interest on the bonds.

*Employment of stockholders on maintenance work.*—In some communities water users are customarily employed for maintenance work on the company canals. They are paid either in cash or by crediting their assessment accounts with the value of the work. This is a traditionally important feature of mutual-company operation in Utah, and it is followed in some other areas as well. It was reported as the regular practice of two companies studied, one in Nebraska and the other in South Dakota. Wages paid by these companies were less than the area's prevailing rates, which meant that water users contributed a part of their labor to the enterprise. This state of affairs was satisfactory only so long as all farms were operated by their owners. Other companies utilized the labor of their own stockholders to a greater or less degree. These circumstances applied only to work on company-owned canals and laterals; in many irrigation enterprises of all kinds the water users own the laterals and are responsible for their operation and maintenance.

#### ASSESSMENTS OF NONSTOCK COMPANIES

A few mutual irrigation companies do not have shares of stock. In such cases, assessments are levied against the members in relation to their respective interests in the company. For example, assessments by the one nonstock corporation studied were levied in proportion to the members' ownership of land covered by appropriations of water delivered through the company canal.

#### TOLLS

Mutual companies may make toll charges for the service of water to their stockholders, in addition to or in lieu of assessments, if their articles of incorporation or bylaws so provide. The general purpose of adding tolls to assessments is to apportion the costs of operation and maintenance according to the service rendered, and capital expenditures according to holdings of capital stock, although many companies do not draw the line as sharply as this.

Making toll charges for water is generally practiced by mutual companies in southern California. A study made in 1935 (16, pp. 144-145 and 155) of 48 mutual companies in that area, which included practically all of the larger ones, showed that 32 were using tolls, mostly in addition to assessments. It also showed that for all of the companies for which segregations of operating income could be obtained for 1930-34, the average income per acre from sales of water, almost entirely to stockholders, exceeded in the last 4 years of the 5-year period the average income per acre from

stock assessments. Only 5 of the 17 mutual companies in the present study made charges regularly for water service. As in the case of irrigation districts, the bases of the charges varied considerably.

#### SERVICE OF WATER TO NONSTOCKHOLDERS

Mutual irrigation companies customarily deliver water only to their own shareholders, or members, at cost. This is the purpose of this type of enterprise. It must be made the principal object in order to establish exemption from income taxation and, in at least some States, to avoid regulation of public-utility service. Some companies, however, carry water for other organizations, or for various reasons they deliver water to some users who are not shareholders.

Only two of the mutual companies in the present study were reported as serving nonstockholders. In one case only a small quantity of water was delivered to a nonstockholder who held a senior priority in an irrigation ditch that had been acquired by the company. The outside service of the other company, which originated as a Carey Act project, covered a considerable area and included several mutual companies and a number of small individual consumers. A large part of this service originated in "water-right" deeds which were exchanged for shares of stock in these other companies to facilitate construction and maintenance of the main canal. Some of the outside service, however, included rentals to small suburban tracts.

#### UNINCORPORATED IRRIGATION ASSOCIATIONS

These organizations derive their revenues from payments by members of their proportionate shares of the necessary expenditures. Certain State statutes provide for the incurring of costs of operation and maintenance by part of the members of such an association and recovery from the others of their just proportions. Recovery from any member of an unincorporated association who refuses to pay his share of a needed expenditure must be by court action.

#### COMMERCIAL IRRIGATION COMPANIES

Revenues of private-contract irrigation companies come chiefly from payments for use of water made by holders of "water-right" deeds or contracts, pursuant to rates fixed by agreement between the company and the water users and not subject to public regulation. Those of public-utility companies come from payments made by consumers under rates fixed by public authority, or subject to such regulation. Construction or development companies were intended for limited life with profits to be derived from sales of their completed works, and with only incidental income from water service during the development period.

#### PRIVATE-CONTRACT COMPANIES

Many irrigation companies entered into contracts with water users. These contracts specified fixed annual charges which were

intended to cover costs of operating and maintaining the system, such as \$2 an acre per annum for the life of the contract. In many cases the contracts were to be perpetual. The charges were predicated upon the economic conditions that prevailed when the contracts were executed; they were made low in order to be attractive to prospective settlers; they included little or no margin against future changes in economic and operating conditions; and they were inflexible. Furthermore, they were usually the only source of revenue, the very existence of which depended upon the willingness of persons to patronize the company by entering into such contracts.

After their contracts were executed, private-contract companies faced mounting costs of operation and maintenance. When such contracts ran perpetually, the company had no authority to increase rates as costs of operation rose. Nor could the water users require lower rates in periods of depression, as could be done in the case of companies subject to public regulation. Water users often benefited at first. Eventually, however, they felt the effects of inadequate service, as the company necessarily had to cut costs of operation or go out of business. For this reason, among others, many private-contract companies have gone out of business and have been succeeded by districts or mutual companies. Others have continued operating. Some of those that continued operating at a loss, including one company in the present study, eventually showed the effects in deterioration of physical works and in quality of service. In some cases contract holders may have agreed to pay higher rates in order to obtain better service, but it is doubtful whether this occurred very often.

Two companies studied benefited from the fact that their contracts provided for apportioning the actual annual costs of operating the various facilities to the lands served. The apportionment was made annually and was based upon the books of the companies, without the necessity of obtaining the further consent of the water users.

#### PUBLIC-UTILITY COMPANIES

Commercial companies that serve irrigation water to the public derive their revenues from rates paid by the consumers. These rates are either regulated by the State or are subject to such regulation. The rates take various forms. Some consist of annual charges per acre irrigated. Others are based upon quantities of water delivered to the consumer. Still others couple standby charges with quantitative charges for the actual use of water.

Theoretically, rates charged by a public-utility irrigation company may be so regulated by the State as to enable the company to stay in business and to perform its public-service functions at a profit. Actually, in various cases it has appeared inadvisable to order rate increases or to apply for them (12, pp. 9-14). To fix rates that consumers either will not or cannot pay means loss of business and of the company's chief source of income. For this reason, many public-utility irrigation companies have continued to operate without profit.



## THE "WATER-RIGHT BONUS" CHARGE

In early days, many commercial companies required prospective consumers to make payments for "water rights" as conditions precedent to the service of water. These payments reimbursed the companies for substantial portions of the cost of construction of irrigation systems. In some cases, they were intended to cover the entire estimated cost. Some of these contracts provided that upon the fulfillment of certain conditions the irrigation systems would be deeded to the contract holders; others contained no such provision and payment for a "water right" became known as a "bonus" or "royalty." In some cases exaction of a bonus by a company engaged in public service has been held to be illegal (30, vol. I, p. 733, and vol. II, p. 1181; 12, pp. 18-20).

The initial "water-right" charge ranged in some instances from \$5 to \$15 an acre. However, in two cases studied the current charge for a perpetual "water right" is \$50 an acre. In one of these cases the charge had once reached a high of \$100 an acre. When the contract contained no provision for deeding the system to the water users, the purchasers of such permanent rights to receive water contributed materially to the capital cost of the irrigation system, although they did not acquire immediate or prospective title to any part of the system or any control over its operation. Under contracts that provided for eventual conveyance of title, conveyance was subsequently made, or the equities of the contracting water users were protected pending the transaction. Some companies that had made initial "water-right" charges were held to be engaged in public service. In these cases bonus payments were taken into account in adjusting the annual rates for water service as between consumers who had made such payments and those who had not done so.

## WATER SERVICE

## WATER PRIVILEGES UNDER IRRIGATION ORGANIZATIONS

## APPLICATION OF WATER-RIGHT LAWS TO IRRIGATION ORGANIZATIONS

State laws that govern the acquisition and exercise of appropriative water rights apply to water users in general—individuals, unorganized groups, and public and private entities. Thus a district or a private company may appropriate water for use within a designated area. The organization holds the formal title to the appropriative right, but the water users have either the beneficial ownership of the water right or at least a beneficial interest in it. Or individual users may hold the legal as well as the equitable title to the water right, the enterprise having title to the irrigation works only. Or the enterprise organization and the water users may be deemed to hold the appropriative right in common, the acts of both being necessary to effectuate a valid appropriation and to keep it alive (17, pp. 311-313; 16, pp. 212-219). Most of the water rights under which the enterprises studied delivered water to users were appropriative rights.

Riparian rights to the use of waters of surface streams inhere in the ownership of lands riparian to the stream. The title to a riparian right vests in the riparian landowner, even though the water to which the right relates is served to the riparian lands by an organization.<sup>26</sup> Three irrigation enterprises studied included lands for which riparian rights were claimed.

Title to a correlative right to the use of ground water, which in many respects is analogous to the riparian right, likewise belongs to the owner of the overlying land.<sup>27</sup>

#### APPURTENANCE OF WATER RIGHTS AND WATER PRIVILEGES TO LAND\*

Whether the right to receive water from an irrigation enterprise is appurtenant<sup>28</sup> to a specific tract of land depends upon the water-law doctrines of the State and, in some cases, upon the character and policies of the enterprise that furnishes the water.

A riparian water right is appurtenant to riparian land (in California, it is more than an easement or appurtenance; it is part and parcel of the land), and although the right may be divested from the land, it cannot be transferred as such to nonriparian land.

An appropriative water right—the type under which most enterprises operate—is generally appurtenant to the land in connection with which the right is acquired. This may be an individual tract or the entire service area of an enterprise. In most States, however, it may be severed from that land and transferred to other land under certain conditions. There are some exceptions to the general rule of appurtenance. In Wyoming, for example, natural flow rights are appurtenant to land, whereas storage rights may be attached to specific parcels by agreement between the reservoir

---

<sup>26</sup> Owners of a tract of riparian land in southern California formed a mutual water company and conveyed all their water rights to the company in exchange for all shares of stock of the company. They then proceeded to sell the lands to individuals, accompanied in each case by a proportionate number of shares of the mutual-company stock. The California Supreme Court held that title to the riparian rights never had been divested from the landowners, and that any title held by the mutual water company at any stage of the transactions was only as a trustee.—*Copeland v. Fairview Land & Water Co.*, 165 Calif. 148, 161-163, 131 Pac. 119 (1913).

In California, a city may claim a riparian right for municipally owned land riparian to a stream, but not for privately owned land in the city. *Antioch v. Williams Irrigation District*, 188 Calif. 451, 456, 205 Pac. 688 (1922). In Texas it was held that a city may be a riparian proprietor in its corporate capacity and entitled to riparian rights in a stream on which it owns land. *Grogan v. Brownwood*, 214 S. W. 532, 536 (Tex. Civ. App. 1919).

<sup>27</sup> Cases that involve the powers of public organizations in California to enforce the rights of landowners to ground waters are discussed in a study of western water law (17, pp. 193-194).

<sup>28</sup> An appurtenance to land is something that belongs to and is attached to the land and passes with title to the land. A water right that has been acquired and is exercised in connection with the beneficial use of a specific parcel of land is often held to be appurtenant to that parcel of land, but it is not an inseparable appurtenance. Under certain circumstances an appurtenant water right may be reserved in a conveyance of the land, or it may be separately conveyed. Furthermore, an appropriative right may be lost by abandonment, or by forfeiture under the statutes of some States, and either an appropriative or a riparian right may be lost by prescription (17, pp. 385-386).



owner and the water user or they may be left floating. In Colorado, appropriative rights may or may not be appurtenant to land.

*Irrigation districts.*—Generally, in case of irrigation districts, water rights are held by the organization and are appurtenant to the entire area included within the district boundaries. Some exceptions were noted when the districts had not acquired title to all preexisting individual rights, which retained their priorities and their appurtenance to specific tracts of land.

As distinguished from the water right to which the district holds formal title, the right of a holder of irrigable land within an irrigation district to receive water from the district is usually appurtenant to the specific tract of irrigable land. Such land was included in the district and subjected to taxation for district purposes because of the benefit that was expected to accrue from the district operations. Indirect benefits arise whether or not the particular land is irrigated. For example, the value of the land in the district is increased. In certain cases the courts have regarded an incidental or indirect benefit flowing from a public improvement as sufficient to justify the imposition of a part of the burden of the improvement.<sup>29</sup> But the primary reason for including irrigable land in an irrigation district is to provide that land with water. This direct benefit is the chief legal justification, and in many Western States the only one, for so including the land and for assessing it for district purposes as compensation for the direct benefit thus received. This direct benefit—the right to receive water—pertains to the specific tract, as listed on the assessment roll, and is therefore appurtenant to that tract.

*Other districts.*—Water rights of districts other than standard irrigation districts may be appurtenant to individual tracts, or to entire areas within the boundaries of the district, depending upon applicable State laws and the particular circumstances under which the rights were acquired.

The right of an individual to receive water from some districts vests in the owner of land within the district solely by reason of inclusion of the land because of the benefit to be derived. This is the case with the California water district. Each landowner in such district is entitled to an apportionment of water based upon the ratio of his latest assessment to the total assessment of the district. But if the district's revenue is derived from sale of water in lieu of assessments, water sold to landowners must be apportioned ratably to each landowner who applies for it.

The right to individual water service in some other types of

<sup>29</sup> In *Los Angeles County Flood Control District v. Hamilton*, 177 Calif. 119, 126–127, 169 Pac. 1028 (1917), the California Supreme Court stated: "An examination of these cases will show that the courts have regarded an incidental or indirect benefit as sufficient to justify the imposition of a part of the burden of the improvement. Such indirect benefit may result from the improvement of neighboring and surrounding land, and the consequent increase in the value of all land within the district." In 26 California Jurisprudence, p. 368, sec. 583, it is stated with regard to irrigation districts: "... land may be included even though it is only incidentally or indirectly benefited, as where it shares in the general increase of land values owing to the improvements in the vicinity."



districts, including the Colorado water conservancy district and the Nebraska public power and irrigation district, is derived from the execution of a voluntary water-service contract between the individual landowner and the district. The question of appurtenance of the service right to the land depends upon State law and the terms of the contract. For example, the right to water service under the contract between the water user and the Colorado water conservancy district is attached to and transferable with the lands described in the contract, but use of the water is not necessarily limited to such lands. Moreover, the district has statutory authority to transfer permanently the right to water service from one tract to another. If all water charges have been paid, this transfer may be made only with the consent of the affected landowner. In case of delinquency, the board may declare the contract forfeited and may sever the water-service right from the land without the owner's consent.

*Mutual irrigation companies.*—Title to water rights exercised by a mutual company may be vested in the irrigation organization or in individual shareholders, depending upon State law and upon the action taken in acquiring the rights.

Appurtenance of water to land is an element of the water right; it is to be distinguished from appurtenance of mutual-company stock to land, which is a contractual matter between the company and its stockholders. In practice, the two terms often amount to the same thing. Even when the water is legally appurtenant only to the general service area, locating shares of stock upon individual tracts of land would tie the service of water to those tracts. The water rights under which a mutual company operates may be appurtenant to the general service area or to the individual tracts served by the company, depending on the circumstances (16, pp. 30-32, 65-76).

*Commercial irrigation companies.*—Commercial companies usually hold formal title to the water rights they exercise. But the question as to whether a company is to be regarded as the appropriator or as merely the agent for individual consumer-appropriators has been decided differently in different States.<sup>30</sup> One Colorado company studied was involved in a case in which it was held that neither the company alone nor the consumers alone were appro-

---

<sup>30</sup> For example, the Oregon Supreme Court held in the case of *In re Walla Walla River*, 141 Oreg. 492, 496-498, 16 Pac. (2d) 939 (1932), that when a public service corporation had complied with all the provisions of a statute relating to the use of certain waters for general rental, sale, or distribution, the corporation, and not the owner of the land supplied, was the appropriator of the right to use the water. On the other hand, the Arizona Supreme Court stated in *Whiting v. Lyman Water Co.*, 59 Ariz. 121, 124, 124 Pac. (2d) 316 (1942), that the right to the delivery of water from an irrigation system owned and operated by a corporation "depends entirely upon the right of appropriation held by the water user, and is not in any manner dependent upon his owning stock in such a corporation. Such companies have duties similar to that of common carriers, and must carry the water which they do not, and can never, own, to the person who has the right to use it by virtue of an appropriation under the laws of the state, upon the payment of proper carriage charges, regardless of the ownership of stock in the corporation."

priators in the strict sense of the term; their combined acts were necessary to constitute the appropriation and to keep it alive.—*Jefferson County v. Rocky Mountain Water Co.* (102 Colo. 351, 356, 361, 79 Pac. (2d) 373 (1938)).

Water served by a commercial company may be appurtenant to the general service area, as with enterprises that have been declared to be public utilities and are bound to deliver water to any applicant within the dedicated area upon payment of the prescribed rates. It may also result from adjudication of the company's water rights to the general area. But if the water users rather than the corporation are regarded as the true appropriators, the water rights may be appurtenant to the individual tracts irrigated, as in Arizona. Furthermore, deeds or contracts between company and consumers usually relate to specific parcels of land.

#### INDIVIDUAL WATER PRIVILEGES

*Districts.*—The right of an individual to receive water from an irrigation or other district depends upon the provisions of the statute under which the district is organized. The measure of the right varies considerably from State to State and within States.

*Irrigation districts.*—State irrigation-district laws usually contain provisions that relate to distribution of water by the districts. Some of these laws prescribe the basis of apportionment of water (13, pp. 94-97). The various statutory requirements include: (1) An equal quantity of water to each acre assessed for district purposes; (2) a quantity based upon the ratio of the assessed value of the tract to total assessment for the district; (3) a quantity measured by individual allotment of water; (4) an apportionment "pro rata" to lands, subject to the law of priorities, or pro rata to lands assessed; and (5) an "equitable" quantity of water on the basis of its beneficial use. Statutes of several States provide that water acquired under a contract with the United States shall be distributed according to Federal laws and regulations and the provisions of the contract. Various State statutes authorize delivery of water to district landowners upon payment of tolls or water charges, which may be either uniform per acre or graduated in relation to quantity of water delivered.

Generally, all irrigable lands subject to district assessments are entitled to water service, for which they must pay according to procedures prescribed by statute. In some States the right to water service may be assigned under prescribed conditions. Lands not irrigable for one cause or another may be excluded from the district, or they may be given nominal assessments. Because of limited water supplies, one of the districts studied took tax titles to most of the undeveloped lands and another arranged for the waiving of rights on the poorer lands. Thus in both cases claims for water for use on such lands were forestalled. In 13 of the irrigation districts studied, distribution of water was made on a practically uniform basis per acre. In 7, the quantities of water delivered were optional with the users, within limits, and charges for water were made in accordance with the quantities so delivered.

Provisions in the irrigation-district laws relating to the appor-

tionment of water stem from the fact that the district is a taxing entity—it taxes lands primarily because they are benefited by their right to the service of water. District assessments are predicated upon the benefits. The quantity of water a landowner is entitled to receive is an element of the benefit; sometimes it is the only benefit that is taken into consideration. Allocations of water privileges by irrigation districts, therefore, must be in harmony with both the water rights of the district and the assessments of benefits.

*Other districts.*—The basis of individual water service in the California water district depends upon whether district levies assessments. The statute provides that all waters distributed for irrigation purposes shall be apportioned ratably to each landowner according to the ratio of his latest assessment to the total assessment for the district. But if water is sold to district landowners in lieu of raising money in whole or in part by assessment against lands, the water so sold must be apportioned ratably to each landowner who applies for it under rules and regulations established by the board of directors.

The privilege of obtaining water from a Nebraska public power and irrigation district or from a Colorado water conservancy district depends primarily upon the contractual relations between the water users and the district. Water contracts are voluntary on the part of landowners; and the district boards of directors at their discretion may grant or deny any application for water service. The supply of water to which a user is entitled, the method and time of delivery, and the annual charges for water are determined by the terms of the contract.

*Mutual irrigation companies.*—The privilege of obtaining water from a standard incorporated mutual company is derived from the holding of shares of its capital stock. For 11 of the mutual-company enterprises studied, ownership of one share entitled its holder to receive a proportionate part of the water available to the company. The cost was covered mostly or entirely by stock assessments. In six of these cases, the number of shares per acre was uniform, or substantially so; in the others it varied from farm to farm.

A mutual company that has an appropriate right covering its entire service area may limit itself by its own articles of incorporation and policies to an inflexible basis of apportionment of water. For instance, it may allocate one share of stock to each acre with no provision for additional shares for the land so stocked or for toll charges. Or it may allow a stockholder to own any number of shares, regardless of his irrigated acreage, or to obtain additional water by paying toll charges therefor. So far as the corporation law is concerned, a mutual company has great latitude with respect to allocations of water privileges. Such allocations must necessarily be in harmony with the terms of the water rights involved.

*Commercial irrigation companies.*—A private-contract company may limit itself by its contracts to the delivery of uniform quantities of water per acre, or it may provide for variable deliveries. Some public-utility irrigation companies base their rates on irrigated acreage; others on quantities of water delivered.



Water privileges under commercial companies arise chiefly by virtue of (1) perpetual "water rights" represented by deeds or contracts between the company and consumers and usually attached to specific tracts of land; (2) water-rental contracts, executed annually or for longer terms; and (3) in case of a public-utility company, location of land within the service area of the company. Ordinarily, rights of water users under commercial companies do not include ownership or control of the irrigation system.

#### ALLOCATIONS OF WATER TO CONFORM TO LAND REQUIREMENTS LIMITED

In some States the extent to which an irrigation organization of any type can vary deliveries of water to satisfy varying requirements of cropland is limited. This limitation lies in a provision of the State water law which prescribes the maximum quantity of water per acre for which an appropriation of water may be made.<sup>31</sup> Statutory allowances are often adequate, although in some cases they have proved insufficient.

Again, whatever the type of organization, the extent to which allocations of water may be varied to suit requirements of individual lands may be limited by the character of the water right pursuant to which diversion of the water is made. In some cases water rights have been adjudicated with respect to specific individual tracts of land. In other cases, the water right relates to a total quantity of water appurtenant to the entire service area. In this event, the enterprise (if permitted by its organizational law) may do more to adjust allocations of water privileges and deliveries of water to the water requirements of the lands.

Some organizations were formed to take over ownership and operation of irrigation systems under which preexisting water rights of individuals had been established by court decree. Needed adjustments in such cases have faced both legal and human obstacles. In some, no adjustments were made; the enterprises functioned solely as carriers of water for individual users in accordance with their respective rights.

Individual rights to water service as between an enterprise and its consumers, as distinguished from water rights fixed by court decree in favor of individual tracts of land, have been satisfactorily adjusted in the reorganization of some enterprises. For example, an irrigation district was formed to take over the systems of two mutual companies, under which there had been serious inequalities in the holding of water privileges represented by shares of mutual-company stock. The district bought up the outstanding capital stock by issuing bonds to individual stockholders and thereby removed the inequalities. In taking over the system of an irrigation district, one mutual company readjusted the service area satisfactorily. It issued shares of its capital stock to those landowners within the boundaries of the former district who were entitled to be served thereafter by the company; it subsequently bought in the shares attached to some outlying tracts; and it encouraged trans-

<sup>31</sup> Water-appropriation statutes of several States contain such limitations. The statutory requirements of the several States are abstracted in a study of western water law (17, pp. 431-469).

fers of stock which had the effect of concentrating the area of land entitled to the service of water.

#### DISTRIBUTION OF WATER

##### POINT OF DELIVERY OF WATER

A typical irrigation system consists of diversion works; a main canal leading to the irrigated area; and a network of main laterals leading from the main canal, sublaterals leading from the main laterals, and increasingly smaller auxiliary ditches that eventually reach each irrigated farm. It is the reverse of the natural drainage system of a watershed in which small drainageways feed into larger ones until the main river is reached. Some irrigation enterprises own only the diversion works and main canals; others own the complete distribution systems down to the individual farms. In still other cases, there are varying combinations of canal ownership. Operation and maintenance of laterals usually although not necessarily coincide with their ownership. The point at which water is delivered by the enterprise to the users is a function of operation and maintenance (9, pp. 2-7).

Some enterprises deliver water only out of the main canals or main laterals, from which points the water users must convey the water to their farms, sometimes a considerable distance away, in their own lateral ditches. The responsibility of the project ceases at the points of delivery. There the aggregate quantities of water delivered are measured or estimated by the project ditch tenders, regardless of the number of users supplied at a given point. Some farmer laterals that thus head at the project canals serve single farms. The responsibility for operation and maintenance of such laterals rests upon the one user of water. Other laterals are owned in common by several or many farmers. Operation and maintenance of laterals owned by large groups of farmers are usually controlled through some kind of formal organization.

Other enterprises operate large systems of laterals and sublaterals to deliver water to individual farms. This does not necessarily mean that the project canals reach the boundary of every farm. Some were laid out for that purpose; when they were constructed they reached substantially every ownership. But later, subdivisions were often made. Local distribution to the subdivided tracts was undertaken in some cases by the project; in others it was left to local arrangement. An approach to the practice of individual deliveries is made on projects having lateral systems constructed to the corner or high point of some designated minimum area—160, 40, or even fewer acres. The size of the unit was often closely related to the expected type of agriculture. One type of lateral system is that designed to deliver water at points not exceeding prescribed distances from certain legal subdivisions, such as one-half mile from each quarter-section. This type is in much less general use than those previously discussed.

The larger number of enterprises studied went beyond the skeleton systems of main canal and a few main laterals and undertook to deliver water either to the farms or to points within reasonable

distances from them. More of the districts than of the private companies did this, partly because of the greater facilities of districts in floating bond issues for complete construction, and partly because of the practice of the Federal Government of building lateral systems for reclamation projects now operated by districts. In many mutual-company systems, which were built by water users, responsibility for the main canal was collective and that for the farm laterals individual.

#### METHOD OF WATER DELIVERY

The three principal methods of delivering water to users are (9, pp. 7-24) :

(1) *Continuous flow*.—This involves delivery of water into the head of each farm lateral continuously throughout the irrigation season. It does not necessarily mean that each irrigator takes the water incessantly; it means that he has the right to do so. Simultaneous delivery of water to all users in the project usually necessitates very small irrigation "heads" or "streams."

(2) *In rotation*.—This is the delivery of water by turns to various portions of the service area. Water thus may be rotated among sections of the main canal, from one lateral to another, or among the users under each lateral. Larger heads or streams are available to individual irrigators under this method than under continuous delivery. Intermittent delivery permits accumulation of what under the continuous-delivery method would be several small irrigation streams. Many enterprises that follow this method operate under coordinated schedules which result in deliveries to an individual at regular intervals.

(3) *On demand*.—Under this method, deliveries of water are made when requested by a user, in the quantities asked for, and, so far as practicable, with the size of irrigation stream desired. As in rotation, and for the same reason, larger heads or streams are possible in demand deliveries than when water is delivered continuously.

Available data do not indicate that methods of delivering water to irrigators are influenced by the type of irrigation organization. Certain methods of delivering water appear to be characteristic of particular areas in the West; they depend to a greater or lesser extent upon availability of water supplies. Moreover, the betterment of a water supply by an organization as a rule does not appear to have resulted in any material change in methods of delivering water.

#### MEASUREMENT OF WATER

About three-fifths of the enterprises studied were reported as measuring the water delivered to the users. Although 70 percent of both mutual and commercial companies so considered measured water to users, only 46 percent of the districts did so. This disparity reflects the somewhat higher proportion of fully adequate water supplies of the districts; it may also be due partly to the fact that many districts accord uniform water privileges to all owners of assessed land, based solely upon acreage. When this is done the



incentive for measurements is usually less than when quantitative charges for water are imposed. Water deliveries by many mutual companies, on the other hand, are uniform per share of stock, while those made by commercial companies depend upon contract or public-utility rights. This contrast is not complete, as stock holdings in a substantial percentage of mutual companies are uniform per acre and in many such cases tolls are not charged. Rights under a number of commercial companies are also uniform per acre, although many public utilities make charges according to the quantity of water delivered.

Installation of measuring devices takes a good deal of money. The tendency of various enterprises that have not measured water to users is to get along without this expenditure so long as the users are reasonably satisfied. In some cases, repeated water shortages and the necessity of conserving water have led organizations to make the necessary expenditure for installing measuring devices.

Among the several methods of measurement studied, the use of weirs greatly predominated. Weirs were either rectangular or were Cipolletti (trapezoidal) weirs. Other devices included Parshall flumes, submerged orifices, and commercial meters.

#### COST OF IRRIGATION WATER

For the individual enterprises studied, the prewar average annual cost of water to farmers per acre irrigated ranged from 8 cents to \$28 an acre. In recent years costs have increased as a result of inflation. From 1939 to 1945, for 45 enterprises for which comparable figures were available, the total per acre charge for water increased by 25 percent. For 22 enterprises for which operation and maintenance costs were available separately, the increase in the cost of operation and maintenance was only 17 percent. This indicates that the increase in total cost was more a result of increased payments on indebtedness than of increased operating costs.

The average cost of water ranged from 8 cents to \$17 an acre for mutual companies, from 60 cents to \$24 for commercial companies, and from 75 cents to \$28 for districts. These differences are consistent with differences in type of farming—more intensive farming can pay higher costs per acre for water—but they are not believed to indicate a significant relationship to type of organization.

Cost of water is discussed further in a later section, which deals with the success or failure of irrigation enterprises.

#### MANAGEMENT

##### CONTROL OF MANAGEMENT

Management of an irrigation district is delegated to an elected board of directors, who are chosen by the landowners or general electors within the district, depending upon the State law under which the district is organized. In the case of an incorporated irrigation company, management is in the hands of a board of directors elected by the stockholders of the corporation. In the case of a

mutual company, the stockholders are also the water users; under a commercial company, water users who also own shares of its capital stock—when any of them own shares—seldom constitute more than a small percentage of all consumers.

Management of a district or a mutual company, therefore, stems from the users of water served. In some districts, it stems from the general electors within the locality, who are usually at least fairly representative of local sentiment. But in the case of a commercial enterprise, the stockholders may have no local interest other than ownership of stock in the corporation and management is not local. This sometimes has considerable bearing upon management-consumer relationships, as noted below.

Active management is performed by a manager, engineer, or superintendent appointed by the board of directors and subject to its control. Authority given to the manager varies considerably. The size of the operation and maintenance staff depends upon the size of the system and of the service area, and the extent to which water is distributed by the organization. Other things being equal, an enterprise that delivers water to individual farmers necessarily has a larger operating force than one that delivers water only out of the main canal.

#### CHARACTER OF MANAGEMENT

No significant differences in efficiency of management among types of irrigation organizations were revealed by the present study.

The character of management of the larger number of the enterprises studied was apparently adequate for successful operation at reasonable cost, in view of the circumstances of the projects, regardless of type of organization. Some reports did not rate the efficiency of the management, or did not reveal enough information to draw conclusions concerning it. However, in the greater number of cases the management was reported as good, or the statements in the schedules justified such an inference. In several instances, management was obviously of high quality. In only two cases was the management considered definitely poor. One of these was a district and the other a commercial company.

#### QUALITY OF SERVICE

The quality of the service rendered to the water users of an irrigation project depends partly on the financial circumstances of the enterprise. A project may not render service of high quality because of its inability to pay for the service. But its management may be doing the best it can with what it has to work with. Therefore, considering all the circumstances, the service is good. Furthermore, some systems require a high type of management to cope with the problems involved and to operate with any reasonable degree of efficiency. Others may get along with spending little for overhead and management but may still give as good service as is required. Under the local circumstances, high-cost management may not be needed.

Although the quality of the service varied considerably among the enterprises studied, little relation was apparent between quality of service and type of organization. The system of one commercial company and the service it rendered to its consumers were poor as a result of inadequate revenue from inflexible annual rates fixed by contract. This situation has existed in the case of similar commercial enterprises not included in the study. However, this is the only correlation revealed. It does not apply to those cases in which revenues of commercial companies have been adequate.

#### DISTRICTS

The service rendered by most of the district organizations studied appeared to be at least good. The range was from fairly good to excellent. In several cases, the policy of making betterments whenever needed, of rounding out water supplies to meet requirements by acquiring supplemental supplies when available, or of defending the water rights against attack, has resulted in service of better quality than would have been the case had the management been less diligent. Deferred maintenance of varying extent and seriousness was reported in several cases.

#### MUTUAL IRRIGATION COMPANIES

Irrigation systems of the greater number of the mutual-company enterprises studied were reported in good condition. The quality of the service was said to be satisfactory. Systems of several companies were stated to be fair, or fair to good, indicating that some improvements were needed.

#### COMMERCIAL IRRIGATION COMPANIES

The condition of the system and the service of water of the larger number of these companies studied were reported to be good, without qualification.

#### MANAGEMENT-CONSUMER RELATIONSHIPS

Ordinarily, relations between management and users of water are more satisfactory under district and mutual-company organizations than on commercial-company projects. This is because the water users own and control the systems of the former. If enough dissatisfaction with management policies arises under a district or a mutual company, new directors responsive to the prevailing sentiment are elected. No such ultimate control by water users exists in a commercial enterprise. Factionalism may arise in community enterprises; serious conflicts have developed between members of boards of directors of some such enterprises. Nevertheless, on the whole, dissatisfaction of water users with management comes to attention more generally under commercial enterprises.

Interests of the management of districts and mutual companies usually lie more with the water users than with the financiers and creditors of the enterprise. Interests of the management of commercial companies lie more with the financiers and creditors. Water users might consider management satisfactory if the charges for water were lowered even though not all its indebtedness



could be met. But the creditors or a management concerned with the credit standing of the organization would not consider it so. Satisfaction of water users with management of irrigation districts and mutual companies does not necessarily indicate management aimed at financial success of the enterprise. Dissatisfaction with management of commercial companies may stem chiefly from desire for water at a lower cost.

Relationships between management and water users were reported to be satisfactory in the larger number of the districts studied. Satisfactory relationships between mutual irrigation companies and their water users seemed also to be general. Some dissatisfaction was reported, however, in the case of a few districts and mutual companies.

In few cases were there no reports of current dissatisfaction on the part of water users with management of commercial companies. Discord arose from various causes, although much of the contention has been over rates. In certain instances, this has resulted in expensive litigation and in regulation of rates.

### EXEMPTIONS FROM TAXATION

Exemption from certain forms of taxation accrues to irrigation organizations of certain types under both Federal law and the laws of various States. Federal exemptions necessarily apply equally in all jurisdictions, but State laws differ considerably.

#### FEDERAL INCOME TAX

##### DISTRICTS

Districts formed for irrigation purposes which are political subdivisions of the States in which they are organized are exempted from payment of Federal income taxes.<sup>32</sup> Interest on their bonds is also exempted from Federal income taxes.<sup>33</sup>

##### MUTUAL IRRIGATION COMPANIES

The income of a mutual irrigation company, which, even though privately owned, is characteristically a nonprofit enterprise, is exempted from Federal income taxes if 85 percent or more of such income is collected from its own members solely to meet losses and expenses (27, sec. 101 (10)). The 85-percent limitation allows some margin to a primarily mutual company which derives revenue from sources that yield a profit, when this profit is a minor part of its total income. Some mutual companies have had income from sources other than assessments and toll charges paid by stockholders for irrigation-water service. Such sources include oil-producing lands and sales of domestic water to outsiders.

<sup>32</sup> Income of States, municipalities, and other political subdivisions is exempt from taxation under the Federal income tax law (27, secs. 22 (b) (8) and 116 (d)).

<sup>33</sup> Interest on obligations of a State or any political subdivision thereof is exempted from taxation under the Federal income tax law and is excluded from gross income reported by the taxpayer (27, sec. 22 (b) (4)).

Interest on bonds of mutual companies is not exempted from Federal income taxes.

#### COMMERCIAL IRRIGATION COMPANIES

The Federal income tax law does not exempt commercial irrigation enterprises, which are enterprises for profit.

#### STATE TAXATION

A complete study of State tax laws was not made in connection with this study of irrigation-enterprise organizations. Enough was done to reveal that various States accord certain exemptions to various forms of irrigation organizations and that there is no uniformity in this respect throughout the West. Whether a particular organization has such an advantage, and the extent of this advantage, necessarily depend upon the laws of the jurisdiction in which the organization is formed.

#### IRRIGATION DISTRICTS

The constitutions and statutes of some Western States exempt irrigation districts from taxation. Certain exemptions apply to all property of the district, others to all necessary and useful property and rights, and still others to all property used solely for irrigation purposes. Provisions of certain other statutes particularize the property to be exempted, such as rights of way, ditches, flumes, pipe lines, dams, water rights, reservoirs, pumping plants, "and other property of like character." The intent evidently is to cover the water supply and works generally. Several State laws exempt the bonds of irrigation districts from taxation.

In some States, exemptions in favor of districts relate to all taxation. In others they relate to taxation for State and county purposes or for State, county, and municipal purposes, including the State income tax if there is one.

#### MUTUAL IRRIGATION COMPANIES

Mutual irrigation companies are specifically exempted from taxation in various States. This may result, for example, from exemption from taxation of all irrigation works without mention of type of organization; exemption of irrigation canals and appurtenant water rights if the water is used for irrigation and is not sold or rented; or specific exemption from separate taxation of the water rights and works of these companies so long as they are used for the service of their own members only.

Other exemptions apply to property used to generate and deliver power for pumping water for irrigation and drainage if the pumped water is not sold or rented. The exemption accrues to the benefit of the consumer. Still another is exemption from payment of the State income tax.

In general, corporations must pay taxes or fees incident to obtaining and holding their franchises. The extent to which irrigation corporations are exempted from paying all or part of the amounts otherwise applicable was not investigated, but it is known

that in at least some States they have privileges not accorded to corporations for profit.<sup>34</sup>

#### COMMERCIAL IRRIGATION COMPANIES

Commercial companies are not usually accorded the same exemptions from taxation of their irrigation property as are districts and mutual companies. Throughout the West exemptions ordinarily accrue only to nonprofit enterprises. No instance in which a commercial irrigation company was exempted from payment of the corporation tax came to the attention of the authors of this publication. In some States commercial companies pay taxes which amount to a substantial proportion of their total expenses. In such States, on the contrary, districts have no taxes to pay and mutual companies have less than commercial companies or none at all.

#### INCLUSION OF LAND IN IRRIGATION PROJECTS

Inclusion of a tract of land within an irrigation project does not necessarily mean that, if the project is built, that tract will be entitled to the service of water and liable for its cost. Within many irrigation projects, the gross areas are greater than the areas subject to assessment or under contract with the irrigation organization. In the case of irrigation districts this came about in many cases because the works that eventually were built did not cover the entire area originally contemplated, or because for other reasons the benefits to certain areas did not materialize. In the case of nontaxing organizations, the owners of all lands did not agree to take water from the organization.

A landowner within an irrigation project may become a potential water user, whatever the type of organization, if his land is within reach of the distribution system and the water supply is adequate. However, the right of a landowner to water service and the cost liability depend upon relationships with the organization, which are voluntarily assumed in some cases but are involuntary in others.

#### INCLUSION OF LAND AT TIME OF ORGANIZATION

##### IRRIGATION DISTRICTS

If a tract of land within the boundaries of a proposed irrigation district has no water supply and the organizers propose to make a supply available, this land will be included within the district if formed. It will be made subject to the obligations thereafter incurred by the district, regardless of the wishes of this particular landowner. Thus, even though some of the landowners objected, many districts have been enabled to establish the necessary legal

<sup>34</sup> For example, California requires mutual companies to pay the minimum franchise tax (\$25 a year) but no additional tax based upon income arising out of business activities with their own members or with nonmembers when done on a nonprofit basis. Business with nonmembers that yields a profit is taxable. Utah exempts incorporated mutual irrigation companies from payment of the franchise tax if 85 percent or more of their income consists of collections from members for the sole purpose of meeting losses and expenses.



relationships with enough owners of irrigable land, as a result of favorable vote by the latter, to make the projects feasible. Lands so included and assessed are subject to loss at tax sale if assessments are not paid.

An irrigation district cannot include land that lies within a State other than that under the laws of which it is organized. In other words, a single district organization cannot overlap a State line. For an interstate project, however, districts can be formed on both sides of the State line. These districts must enter into contracts concerning their interrelationships. The laws of several States specifically authorize irrigation districts to contract with districts in adjoining States in constructing, acquiring, and operating works. A Colorado district studied acquired control of the systems and rights of two mutual companies, most of whose lands were in Colorado although some were in Nebraska. The district assumed the obligation of delivering to the Nebraska lands the water to which their rights entitled them.

#### NONTAXING ORGANIZATIONS

Organizations that do not have the power of taxation cannot compel landowners or water users within reach of their water-distribution systems to patronize them. Inclusion of land within the service area of a nontaxing district, mutual company, or commercial company does not, in itself, establish relations with the landowner or prospective water user. It means that when the service of water is offered to a landowner by the enterprise, he may accept or reject it at his pleasure, and in the latter event without liability.

The initial establishment of relationships between the enterprise and the water users in the case of a nontaxing organization, therefore, is voluntary with all parties. Mutual companies may prescribe the qualifications of their stockholders; but there is no legal compulsion upon the part of anyone to become a stockholder. Private-contract commercial companies may either accept or reject applications for contracts from persons who wish to contract for water service. Inclusion of land within the area to which a public utility has voluntarily dedicated the service of its water supply means that the landowner has the right to the service, provided that the supply is adequate and that he pays the proper charges. However, if he chooses not to accept the service, he is under no compulsion to patronize the company or to pay any charge. A private-contract company selects the individuals with whom it is willing to establish water-service relationships. A public utility does not do this but it voluntarily adopts the policy of serving the public, selects the water supply or portion thereof that it chooses to dedicate to the public, and selects the area within which it is willing to enter into such service.<sup>35</sup>

Subscriptions of capital stock of some mutual companies have been made, or at least agreed to, prior to and effective upon incorporation. The amount of stock each party has subscribed is stated

<sup>35</sup> Changes in the area so selected may be required by the State public utilities commission if necessary to safeguard the interests of consumers (12, p. 32). See p. 74.

in the articles. Stock of other companies has been subscribed after the organization has become a legal entity.

Relationships between landowners or prospective water users and a nontaxing district or a commercial company with respect to the service of water and payment therefor necessarily are established after the enterprise has been organized. Only then is the organization a legal entity, capable of entering into contracts, accepting applications for public-utility service, or assuming the undertakings of a predecessor organization. Liability of a landowner to assessment by an irrigation district, by contrast, is created by law when the district is organized.

Land within a nontaxing project is not subject to loss for nonpayment of assessments or contract charges, except in the comparatively few cases in which organizations have contractual liens against the lands, voluntarily assumed by the landowners. The right to service of water from a nontaxing project may be forfeited under some circumstances. As a result, the value of the lands may be depreciated, but the title to the land is not affected by forfeiture unless a lien has been established as a result of contract.

Private organizations, such as mutual and commercial companies, may have identical relationships with landowners and may provide the same service on both sides of a State line. A mutual irrigation company incorporated under the laws of Idaho owns and operates an irrigation system which lies partly in Idaho and partly in Utah. The company serves water to its stockholders in both States.

## INCLUSION OF LAND IN ORGANIZED ENTERPRISES

### IRRIGATION DISTRICTS

When an irrigation district has been organized, with the lands expected to be benefited included within its boundaries, further inclusions of land may be made. This is done by means of proceedings that originate with petitions by landowners who wish to have their lands included, or by owners of a designated fraction of the area proposed to be included (13, pp. 97-100). After a district has been formed, it may prove desirable to have lands included within it in addition to those originally expected to be benefited. These subsequent inclusions of land are usually voluntary on the part of the landowners concerned, or at least the owners of a substantial part of the lands. The extent to which the district must conform to petitions for inclusion of such lands, and the conditions imposed upon the included lands, depend upon the provisions of the State irrigation-district law.

### NONTAXING ORGANIZATIONS

Relations between some mutual companies and some or all of their original stockholders become effective legally upon incorporation of the company. Those with other stockholders are entered into after the company is organized. A nontaxing district or a commercial company must necessarily complete its organization before it establishes legal relationships with water users.

## EXCLUSION OF LAND FROM IRRIGATION PROJECTS

## EXCLUSION AT TIME OF ORGANIZATION

## IRRIGATION DISTRICTS

Upon the organization of an irrigation district, land, which in the judgment of the public officials who order the formation of the district will not be benefited by the project, is excluded from the district. This is true even though the land may lie within the general service area and may be surrounded completely by benefited lands that are included.

In certain instances, lands for which no provision for water service was planned, but which were so situated that they would receive indirect benefits, were not so excluded. Although California irrigation-district law authorizes inclusion of urban lands within irrigation districts, one large district that completely surrounded a populous municipality excluded the municipality for several reasons.

## NONTAXING ORGANIZATIONS

Only in the case of a mutual company, part or all of the capital stock of which is subscribed at the time of incorporation, are relations with water users established when the enterprise is organized. A mutual company may exclude applicants for stock who do not satisfy the qualifications it prescribes. Other relationships between nontaxing organizations and water users are entered into after the enterprise has been legally organized.

## EXCLUSION OF LAND FROM ORGANIZED ENTERPRISES

## IRRIGATION DISTRICTS

Procedure for exclusion of land from irrigation districts after organization, upon prescribed grounds, is provided by the several State irrigation-district statutes (13, pp. 101-104). This procedure usually originates upon petition of those landowners who wish to have their lands excluded, although in certain instances the initiative lies with the board of directors of the district. Exclusion is subject to the requirement that the obligations of the district be not impaired by exclusion of the land. In the case of a district under contract with the United States, the consent of the Secretary of the Interior is required.

Exclusions of land from a district after its organization are usually voluntary on the part of the landowners concerned. As in the case of inclusions of land after organization, the extent to which the district must conform to exclusion petitions, the grounds for exclusion, and the safeguards and limitations, depend upon the State law.

## NONTAXING ORGANIZATIONS

Methods by which lands are excluded from the service of water by nontaxing organizations with which the landowners have established relationships are not comparable to the procedures for excluding lands from irrigation districts.



The holder of a contract with a public power and irrigation district, or with a private-contract commercial company, can refuse to accept water service at any time and to make further payments. He is necessarily subject to any penalties that may be provided in the contract or to legal action if the contract is broken. The title to his land is not affected if he severs relations with the organization, unless a lien was fixed on the land as a result of his entering into the contract, or unless it becomes fixed as a result of court judgment if the contract is broken. A public-utility consumer may discontinue relations with the company without liability. The holder of stock in a mutual company, who no longer wishes to utilize the company's facilities, can sell his stock, if it can be sold apart from the land and if there is a market, or he can allow the shares to be forfeited for nonpayment of assessments.

## PUBLIC SUPERVISION AND REGULATION

### IRRIGATION DISTRICTS

#### ORGANIZATION

The statutes of various States provide that petitions for organization of irrigation districts shall be reviewed by the State Engineer or other State administrative official before final action is taken upon the petition by the board of county commissioners or supervisors. Reports by State officials concerning the feasibility or desirability of the proposed projects are made to the county boards. In some States these reports are not binding upon the county boards; they are intended for information and guidance only. In others, if the State report is unfavorable, the board is required to dismiss the petition for organization, unless requested by a prescribed percentage of the landowners to proceed despite the adverse report.

#### ENGINEERING PLANS, ESTIMATES, AND FINANCING

Before bonds can be issued by an irrigation district, many States require the directors to submit plans and estimates to the State Engineer or corresponding State official. The resulting recommendations made by the State officials in most cases are advisory only. That is, they are not binding upon the officers of the district, although in some cases no material changes may be made in plans so approved by the State officials without their consent. In a few States, some measure of supervision over construction of works by irrigation districts is exercised by State officials.

Several States provide for certification by a State commission of bonds issued by irrigation districts. Submission of bonds to the State is optional with the district, but in most cases districts that have issued certified bonds are prohibited from issuing further bonds without certification. The certification procedure involves investigations into the legal, agricultural, and financial conditions affecting the district that has applied for certification. If the conditions are found to meet the prescribed requirements, the bonds

are certified as legal investments for trust funds and certain other private and public funds around which the law places special safeguards.

State supervision over the financing of irrigation districts has not prevented defaults of supervised transactions, and this applies to both certified and uncertified bond issues. However, requirements for investigations into the circumstances of prospective district bond issuers in many instances have been salutary (14, pp. 49-54).

#### REVENUE AND SERVICE

The obtaining of revenue and rendering of service by irrigation districts are not subject to public regulation.

### MUTUAL IRRIGATION COMPANIES

#### ORGANIZATION

No public supervision is exercised over organization of mutual irrigation company projects. If incorporation takes place, it must necessarily conform to the provisions of the applicable State law; but no public hearings are held and no investigations of the feasibility of contemplated projects are made by State administrative officials.

#### ISSUANCE OF SECURITIES

The so-called "blue-sky laws," or corporate securities acts, of the Western States apply to mutual irrigation companies as well as to other companies that seek to issue securities. Securities so affected by the statutes include capital stock as well as bonds. The purpose of the law is not to recommend or endorse any security, but to prevent fraud. Permission to proceed with the issuance of securities depends upon the provisions of the blue-sky law, which may require that a permit be obtained or that the issue be registered.<sup>36</sup>

#### REVENUE AND SERVICE

Assessments and toll charges of mutual irrigation companies are not subject to public regulation, and public supervision is not imposed upon the service they render.

### COMMERCIAL IRRIGATION COMPANIES

#### PRIVATE-CONTRACT COMPANIES

#### ORGANIZATION

Organization of private-contract commercial irrigation company projects is not subject to public supervision. The comments above with respect to organization of mutual company projects apply also to private-contract enterprises.

<sup>36</sup> The situation in California and Utah is discussed in a study of mutual irrigation companies in these States (16, pp. 35-36).

## ISSUANCE OF SECURITIES

Issuance of securities by private-contract companies is subject to regulation under the blue-sky laws to the same extent as the issuance of securities of mutual companies.

## REVENUE AND SERVICE

The obtaining of revenue and the rendering of service by private-contract irrigation companies are not subject to public regulation.

## PUBLIC-UTILITY COMPANIES

## ORGANIZATION

Public-utility irrigation enterprises may be organized without public supervision. They are subject to extensive regulation in various States, but this begins after the enterprises have been incorporated or otherwise organized, when they are ready to undertake their financing and to perform their public-service functions.

## SECURITY ISSUES, CONSTRUCTION, AND ACCOUNTING

In a few States, long-term securities may not be issued by public-utility irrigation companies without approval of the commission that has jurisdiction over the rates of such companies (12, p. 33). The purpose is to make reasonably certain that the company will receive value, and will use it to further the service of water at reasonable cost to its customers.

Supervision over the issuance of public-utility irrigation company securities is of practical importance chiefly in California. Public utilities in that State are authorized to issue notes, payable not more than 12 months from the date of issue, without the consent of the Public Utilities Commission, but they may not refund the notes without the commission's consent. No public utility may issue stocks, bonds, notes, or other evidences of indebtedness payable more than 12 months from the date of issue, without prior approval of the commission (5, secs. 818 and 823). The provisions of the California blue sky law do not apply to any security the issuance of which has been authorized by the Public Utilities Commission (4, sec. 25100(e)).

Approval of the regulatory commission must be obtained in some States before these companies may undertake new construction or extensions of irrigation works (12, p. 34). These commissions may provide for uniform systems of accounts and annual reports. In some States they may require individual companies to set up depreciation accounts.

## REGULATION OF PUBLIC-UTILITY IRRIGATION COMPANY RATES

Rates charged by a public-utility irrigation company for its service of water to consumers may be subjected to public regulation to the same degree as the rates of public utilities of other classes. In several of the Western States, they have been so subjected. In contrast, rates of private-contract companies are not subject to



public regulation because the service performed by such companies is essentially private. Jurisdiction of the regulatory agency over the functions of a particular commercial irrigation company depends, therefore, on whether it is a public utility.

Probably most commercial irrigation companies that are now active can be classified as either private-contract or public-utility companies, but the status of all such companies with reference to private or public service has not been legally determined. Commercial irrigation enterprises are more important in some States than in others. Some public-utilities commissions have been more energetic than others in extending their jurisdiction over irrigation companies engaged in public service. Furthermore, the rates of all irrigation companies determined or conceded to be engaged in public service have not been involved in rate-adjustment proceedings. That is to say, certain commercial companies have been subjected to the jurisdiction of public utilities commissions or other regulatory agencies in actual rate-fixing proceedings. Others have been so subjected by reason of their concession of public-utility status in the course of litigation or by filing schedules of rates (at the direction of the regulatory agency) over which no controversy yet has developed. However, enough controversies have been heard before the courts and commissions, chiefly in California, to develop the controlling distinction between private service and public service of water for irrigation, and the principles that govern public regulation of public irrigation-water service.<sup>37</sup>

#### DISTINCTION BETWEEN PRIVATE-CONTRACT AND PUBLIC-UTILITY SERVICE OF WATER

The distinction between private-contract and public-utility service is sometimes fine, as is evidenced by court decisions which have subjected certain companies to public regulation as to rates and services, even though they had been delivering water only to purchasers of "water rights" from the company as represented by deeds or contracts. The legal criterion is the conduct of the company in making arrangements for the service of water to prospective water users.

*Private-contract service.*—If a company has evidenced no intention of serving water to the public generally, and has taken no action that could reasonably be construed as engaging in such service, but on the contrary has undertaken to render water service only to individuals of its own choosing, this company is a private-contract company over which the public regulatory agency has no jurisdiction. This is because the water so served by the company is in private, not public use. "If the dispenser of water has the right to say who shall have it, and upon what terms, selling to one and refusing to sell to another at will, it is not devoted to

<sup>37</sup> A study of commercial irrigation companies (12, pp. 23-35) summarizes the principles derived from decisions of courts and public regulatory agencies which have declared companies either subject or not subject to public regulation. The study also discusses various features of regulation of irrigation utilities, based upon experience chiefly in California and to some extent in several other Western States.

public use."<sup>38</sup> Whether such a company delivers water to users under arrangements good for only one season or part of a season, or whether it issues "water-right" deeds that run perpetually, does not affect the private character of the undertaking. Such arrangements, whether formal or informal, are private contracts that cannot be altered without the consent of the parties and hence cannot be disturbed by public authority.

To illustrate, an irrigation system was constructed by a development group to service a large area. Purchasers of land paid \$75 an acre for it and \$75 an acre for "water rights" appurtenant to the land, which were represented by certificates that contained binding obligations upon the water company to deliver specific quantities of water and upon the purchasers to pay specified annual rates therefor. The contracts were not assignable by the purchasers without the written consent of the company. The California Supreme Court held that the water in question was held in private ownership; that it had not been dedicated to public use at the time the contracts or water certificates were executed; that the right that thereby was vested in the landowners to whose land the water was thereby made appurtenant was private property; and that therefore the rates were not subject to public regulation.<sup>39</sup>

*Public-utility service.*—A company that dedicates water to the public—that is, that makes service of the water available upon payment of just charges to any or all within reach of the system who apply for it—is engaged in public service, is distributing water that has been devoted to public use, and is subject to whatever measure of public regulation the State laws prescribe for public-utility water companies. "The test to be applied is whether or not the petitioner held himself out, expressly or impliedly, as engaged in the business of supplying water to the public as a class, not necessarily to all of the public, but to any limited portion of it, such portion, for example, as could be served by his system, as contradistinguished from his holding himself out as serving or ready to serve only particular individuals, either as a matter of accommodation or for other reasons peculiar or particular to them."—*Van Hoosear v. Railroad Commission of the State of California* (184 Calif. 553, 554–555, 194 Pac. 1003 (1920)).

<sup>38</sup> *Thayer v. California Development Co.*, 164 Calif. 117, 128–133, 128 Pac. 21 (1912). In this case the company made no offer or declaration that the water was to be devoted to public use or to all landowners within any particular area, and it had no custom or practice of selling water in that way. "The method adopted by it for the disposition of the water, and its conduct in distributing the same, have been wholly inconsistent with the idea that the water was held out for general sale or distribution, and it has been consistent only with the theory that the intention was to retain control of the water to the extent, at least, of choosing for itself the persons and corporations to whom it should be sold or delivered, and the terms and conditions on which such sales or deliveries should be made."

<sup>39</sup> *Allen v. Railroad Commission of the State of California*, 179 Calif. 68, 71, 78, 85, 89, 175 Pac. 466 (1918). "The character of the contracts evidenced by these water-right certificates, the restriction upon transfer, the fixing of the acreage *quantum*, the enormous sum in the aggregate paid by these petitioners for their water rights, establish beyond the need for further discussion that the parties to those contracts believed that they were dealing in their private capacities and selling and receiving water for private use."



Devotion of the water to public use must be of such a character that the public generally, or that part of the public that has been served and that has accepted the service, has the right to demand that the service shall be conducted, so long as it is continued, with reasonable efficiency under reasonable charges. That is, public use means use by the public and individual members of the public as a legal right. Furthermore, a company may devote a part of its water supply to public service and may retain a part for the advantages of private sale without subjecting the latter part to public regulation.—*Allen v. Railroad Commission of the State of California* (179 Calif. 68, 82, 88, 175 Pac. 466 (1918)). But after having dedicated a water supply or part thereof to a public use, the company alone cannot change that use back to a private use.—*Franscioni v. Soledad Land & Water Co.* (170 Calif. 221, 228, 149 Pac. 161 (1915)).

As a result of these principles, some companies are found to be engaged solely in private service, some solely in public service, and some in dual service. The service of one commercial company studied was divided among public-utility consumers, holders of perpetual deeds, and holders of term contracts. The State public utilities commission, although it fixed the rates paid by the public-utility consumers, decided that it had no authority over the rates payable by the other consumers on the ground that they had been fixed by private contract.

Execution of water-service contracts between an irrigation company and its prospective consumers is not inconsistent with dedication of the water to public use, if the intention and the acts of dedication are otherwise present and the contracts are not made with selected individuals. If rates for the water have not been fixed by public authority, the parties are free to contract therefor and are entitled to have the contracts enforced; although public authority may intervene and may modify prior contracts to make them conform to the public interest if they are unjustly discriminatory or unreasonable.—*Southern Pacific Co. v. Spring Valley Water Co.* (173 Calif. 291, 297–300, 159 Pac. 865 (1916)). Such contracts are deemed to have been entered into subject to possible revision by the State, as they relate essentially to public, not private, service.

In a case in which “water rights” were sold to anyone who would sign the form of contract prepared by the company, public-utility service was held to have been undertaken. The only limitations were those necessary for convenient delivery of the water from the company’s canals to the purchaser’s land. “As soon as the contracts were all sold the persons making the purchase and the lands to which the water was to be applied would comprise the portion of the public entitled to the use and to whose use the water was dedicated, so far as it was necessary thereto.”—*Traber v. Railroad Commission of the State of California* (183 Calif. 304, 311–312, 191 Pac. 366 (1920)). “The fact that contracts were made declaring that the agreement to supply water should be appurtenant to the respective tracts of land is not inconsistent with the theory of a dedication to public use. \* \* \* Such contracts relating to the



service of water devoted to public use are subject to regulation and control by the public authorities, whether acting under laws then existing or under laws subsequently enacted."

Public-utility service was held to have been entered into likewise by a company that contracted to furnish water to lands "at such rates as may be fixed by law in the district in which such lands are situated."—*Palermo Land & Water Co. v. Railroad Commission of the State of California* (173 Calif. 380, 384, 160 Pac. 228 (1916)). Apparently the parties originally contemplated that the rates to be charged should be those fixed by public authority. Furthermore, the company had applied to the State Railroad Commission to have its rates established, and the commission had ordered the allowance of an increase in the rates previously in effect.

In still another case (*Brewer v. Railroad Commission of the State of California*, (190 Calif. 60, 78-79, 210 Pac. 511 (1922))) the California Supreme Court held that the declarations of the original appropriators of water and of a corporation formed by them as to the purposes of the appropriation would not in themselves justify a finding that the waters were to be devoted to public use; but that acts of the appropriators and of the corporation in carrying out such declarations, in stipulating in the earliest contracts that whatever "water rights" therein granted were to be subject to "legal rates," and in serving water to the general public, justified a finding that from the first the water had been devoted to public use and that the corporation was a public utility.

#### OPERATION OF RATE REGULATION

*Regulatory agencies.*—In most of the Western States that have provided for irrigation-company regulation, this function is performed by the State commission that has jurisdiction over other public utilities. Colorado, however, still delegates this authority to the boards of county commissioners, as was formerly general practice in the West. The Texas Board of Water Engineers exercises this power in that State.

*Rate-fixing proceedings.*—Proceedings that involve the fixing of rates and regulation of services are initiated either by the regulatory agency, the consumers, or the company itself. Consumers may complain that rates are too high or services inadequate, or that discrimination among them is practiced. The company may ask for an increase in rates or for some change in a particular service that has become burdensome. Hearings are held and orders issued by the public agency, the results of which are sometimes reviewed by the courts.

*Characteristics of public-utility water rates.*—Irrigation water rates are fixed by the public in an effort to provide for efficient operation and maintenance of the irrigation works, a depreciation annuity to cover replacements, and a fair return on the valuation of the properties (12, pp. 25-31). Rates must be reasonable, and they must be fixed and charged without discrimination among consumers.

Rate-fixing commissions apparently have leaned toward rates based upon measured quantities of water delivered, although in some cases they have approved of uniform rates per acre. In some instances, standby or service charges for definite periods of time have been imposed. Examples of all these practices were found in the course of the present study.

*Adjustment of initial charge for "water right."*—The exaction of a bonus or charge for a "water right" by a company that purports to be engaged in public service has been held illegal in some States and is prohibited by statute in some as noted in the discussion of "Revenue." This differs from the sale of "water rights" that purport to represent part ownership of the system. Payments for "water rights" by consumers have called for rate adjustments in certain cases.

One public-utility irrigation company studied sold perpetual rights for \$10 an acre, and subsequently delivered water also to noncontract applicants. The earlier rate revisions made by the State regulatory commission fixed the annual charge against noncontract users at a higher figure than that set for contract users. The initial payments of the latter were treated, in effect, as advance payments on annual rates. However, so much dissatisfaction resulted from the existence of the two classes of consumers that the rate differential was finally abolished.

A company sold "water rights" within both Colorado and Nebraska relating to a canal that crossed the State line. The contracts provided that when all rights had been sold the system would be deeded to the holders. The company also was delivering water to renters who had not bought rights. While the company was still operating the canal, the Nebraska State Railway Commission was called upon to fix the rates to be charged within that State. The rate made to the "water-right" holders did not include a return on value of property, as these parties were held to be proportionate owners of the system and the company was regarded as a common carrier. A higher rate was applied to the renters. The differential covered a return on the value of the property allocated to the service of these renters.

*Value of water right as element of rate base.*—The question as to whether the value of the water right held by the company shall be included in the rate base, along with values of physical works, lands, rights of way, etc., has been raised from time to time. In some cases, the answer has depended upon the particular jurisdictional principle relating to ownership of the water right, that is, ownership by the company on the one hand and by the water user on the other. If the company is held to be a mere carrier of water, the right of use of which vests in the water user, to include in the rate base a value of the water right (other than actual cost incurred by the company in defending or adjudicating the right) requires the water user to pay interest on the value of property owned by himself. However, cases have been decided to the effect that inclusion of water-right valuations in the rate base is proper, and others to the effect that it is not proper. Still other decisions

have been based upon other grounds and have left this question undecided (12, pp. 30-31).<sup>40</sup>

One who accepts from the State of California either a permit or a license to appropriate water under the current procedure must do so under the condition that no value whatsoever in excess of the actual amount paid to the State therefor shall ever be assigned or claimed for any right acquired thereunder in respect to public regulation of the services or price of services rendered by the permittee or any holder of the right so acquired (3, secs. 1392 and 1629).

A Colorado company in the present study, that had delivered water to consumers under renewable annual contracts, was involved in an action to enjoin the enforcement of a rate established by the board of county commissioners.—*Jefferson County v. Rocky Mountain Water Co.* (102 Colo. 351, 356, 361, 363, 79 Pac. (2d) 373 (1938)). The Colorado Supreme Court stated that the decreed appropriations of the company of necessity were dependent upon the joint and practically concurrent acts of the company and the water users, and that neither the company alone nor the users alone were appropriators in the strict sense of that term. The court concluded that neither the whole nor any part of the value of the water rights should be included in the rate base.

State public utilities commissions in various cases have either ignored or specifically excluded water-right valuations from the rate base. In other cases, they have considered but have not included such valuations to an extent that would substantially influence the rate. It seems correct to say that in fixing the rates of irrigation companies, State commissions, on the whole, have been averse to placing substantial values upon water rights beyond the actual cost of their acquisition.

*Effectiveness of rate regulation.*—Theoretically, public utilities are entitled to charge rates for water that are high enough to pay operating expenses and to provide a return on the investment. But in various cases certain circumstances have tended to prevent them from seeking or from putting into force the rates to which legally they have been entitled, and from thus realizing fully adequate revenue. Some of these utilities have found rate increases inadvisable for psychological reasons. By forcing customers to pay higher rates, the company would lose more than it would gain. In other cases the users were financially unable to pay more for the service rendered. On parts of the systems of some utilities, private-contract rates, which public authority was powerless to disturb, were in effect. The failure of so many commercial companies to pay substantial dividends from operations is an indication of their general lack of adequate revenue.

Public regulation of rates cannot guarantee any particular return on the investment in an irrigation project, or any return at all. If farmers are unable to pay rates high enough to yield a profit to the company, they cease to use the water. Public regulation has

<sup>40</sup> In addition, see *Murray v. Public Utilities Commission*, 27 Idaho 603, 619-620, 150 Pac. 47 (1915), and *Capital Water Co. v. Public Utilities Commission*, 44 Idaho 1, 16-20, 262 Pac. 863 (1926).



not stimulated the growth of public-utility irrigation companies because it has not made possible a desirable return on many such investments. But it has made it possible for a number of such enterprises to continue in business, notwithstanding the existence of contracts that otherwise would have caused or threatened failure, and it has enabled them to obtain such returns as economic conditions have justified.

#### REGULATION OF PUBLIC-UTILITY IRRIGATION COMPANY SERVICE

Regulation of the water service of a public-utility company goes along with regulation of its rates (12, pp. 31-33). This includes matters of extending, limiting, and abandoning the service, any of which may require prior authorization of the regulatory commission in order to safeguard the rights and interests of existing consumers. Regulation extends also to prevention of unfair discrimination as among consumers. In addition, some companies have been ordered by commissions to take measures to improve the efficiency of their water-distribution systems.

The power and duty of a public utilities commission to require changes in methods of rendering service depend upon its statutory authorization. In the execution of its statutory powers, however, the commission may exercise discretion as to certain matters.

### ADVANTAGES AND DISADVANTAGES OF TYPES OF IRRIGATION ORGANIZATIONS

#### PROCEDURE FOR ORGANIZING

##### IRRIGATION DISTRICTS

Ordinarily, organization of an irrigation district involves a public procedure in which public officials and locally interested parties participate. Obtaining the signatures of a requisite number of qualified petitioners may take considerable promotional effort.<sup>41</sup> When the petition is completed and presented to the proper public body, such as the board of county commissioners, a public hearing must be held. At this hearing, those who object to having their lands included may show that these lands will not be benefited by the district, or that they will receive comparatively little benefit. A decision by the public body must be rendered with respect to each objection. Investigations and reports by State officials, when they are required, take additional time. In most cases, an election must be held. In a number of instances, proposals to form irrigation districts have been defeated by the electorate.

Granted that the proposed project is desirable, the procedure in organizing a district affords opportunity for open discussions, and in many States, for reports by disinterested public officials. It also enables the community to make the improvement over the objections of a minority, the inclusion of whose lands is essential

<sup>41</sup> About 2 years' promotional work was required for the organization of two irrigation districts for the purpose of replacing a water users' association on one Federal reclamation project. Greater or less time is required in various cases.

to the feasibility of the enterprise. So long as the costs do not exceed the benefits to the objecting minority, the procedure is not unconstitutional on the ground of taking property without due process of law.<sup>42</sup>

Many irrigation districts that were formed eventually proved undesirable. However, the long process of organizing an irrigation district permits the bringing to light of unfavorable factors and the expression of doubts as to feasibility that may be held by interested parties, both public and private. This is particularly valuable with respect to a proposed large project, the success or failure of which may affect the interests of a considerable part of the State. But when applied to simple undertakings, the procedure of organizing is cumbersome.

#### OTHER DISTRICTS

The procedure for organizing an electrical district in Arizona or a water district in California is much like the usual procedure for organizing an irrigation district. The only exception is that investigations and reports by State administrative officials are not provided for. Districts of both types have the power of taxation; hence landowners may object to inclusion in the district. Aside from the matter of advisory reports by State officials, the comments made with respect to irrigation districts apply to these two types of districts.

At public hearings on organization of nontaxing districts, such as the Colorado water conservancy district and the Nebraska public power and irrigation district, any landowner has an opportunity to object to the proposed district. There is little incentive to object, however, as no liability attaches until a landowner obtains a water-service contract from the district. In contrast, before a standard irrigation district can be formed, a number of protests usually must be heard and decided. Moreover, with the Colorado water conservancy districts and the Nebraska public power and irrigation districts, no organization elections are held. As a result, under many circumstances, these districts can be formed with greater speed and less effort than irrigation districts.

#### MUTUAL IRRIGATION COMPANIES

##### CORPORATIONS

The requisite legal procedure for organizing a corporation, which is specified by the general corporation law of the State, is limited generally to execution by a minimum number of persons of the articles of incorporation and to filing them in designated public offices. No report by a public official concerning the water supply or feasibility of the enterprise is necessary prior to incorporation, and no public hearings or elections are held as conditions precedent to organization. As a mutual company is a private

<sup>42</sup> The constitutionality of the original Wright Act of California, upon which the irrigation-district statutes of all of the Western States have been based, was upheld by the United States Supreme Court in *Fallbrook Irrigation Dist. v. Bradley*, 164 U. S. 112 (1896).

organization in which membership is voluntary, the constitutional safeguards against taking the property of a "holdout" without due process of law do not apply.

Mutual companies sometimes encounter difficulties in organizing, although ordinarily they are not matters of procedure. They are more likely to develop after organization from such things as problems involved in acquiring irrigation systems which the companies were formed to take over.

#### UNINCORPORATED ASSOCIATIONS

The procedure in organizing an unincorporated association is whatever the members choose to make it. Whatever advantage may lie in simplicity of procedure applies to such an undertaking.

#### COMMERCIAL IRRIGATION COMPANIES

The procedure in organizing commercial irrigation companies, incorporated and otherwise, is the same as that pertaining to mutual irrigation companies.

#### COMPARISON

An advantage lies in the safeguards against ill-advised undertakings provided by the district organizational procedure in most States. In some respects, these safeguards may not go far enough. If before organization and financing of a district are undertaken, detailed studies of economic feasibility were made, the number of undesirable ventures might be fewer. As contrasted with the district procedure in some States, a disadvantage of mutual and commercial companies lies in the fact that public reports upon water supply and feasibility are not required for these projects, however large and expensive they may be. This may be unimportant in the case of a great many projects, but some private enterprises compare with districts in magnitude, and even though they are engaged in private service, failure may adversely affect the public welfare.

When small projects without serious complications are proposed, mutual and commercial irrigation companies have an advantage over irrigation districts in the ease and simplicity of organization. Organization of a corporation is necessarily more formal than that of an unincorporated association, but even so the procedure is less cumbersome than that relating to an irrigation district.

#### INCLUSION OF LAND IN IRRIGATION PROJECTS

Inclusion of land within the area of a taxing irrigation district places it in line for the service of water when available, and subject to assessment to whatever extent the land is benefited, whether or not the individual landowner wishes it. A chief reason for enactment of the original irrigation-district laws was to provide a means by which part of the landowners within a proposed irrigation project could include and tax enough irrigable land to make the project feasible. On the contrary, organizations that do not have the power of taxation—such as public districts of certain types, and



mutual and commercial irrigation companies—have no way to compel landowners or water users within reach of their water-distribution systems to patronize them. Inclusion of land within the service area of a nontaxing enterprise does not, in itself, establish a liability to the irrigation organization; that liability must be entered into voluntarily on the part of the prospective water users.

Therefore, nontaxing districts, and mutual and commercial companies that build or propose to build irrigation projects are at a disadvantage in comparison with irrigation districts, when inclusion of irrigable lands of an objecting minority is essential to the feasibility of the enterprise. The history of the early commercial companies that built projects before selling "water rights" shows that many of them failed because they could not induce landowners to buy the "water rights" offered for sale.

As it is a political subdivision of a State, an irrigation or other public district cannot extend into a State other than the one under the laws of which it is organized. For an interstate project, instead of one comprehensive public organization, districts must be organized on each side of the State line under the respective State laws for the purpose of cooperating in handling the project. A private company is not inhibited from having identical relationships with landowners or water users on both sides of a State line.

## FINANCING

### IRRIGATION DISTRICTS

#### PRIVATE FINANCING

Irrigation districts have always had a substantial advantage over private irrigation organizations in the comparatively wide markets for their bonds. On the whole, this advantage has been so pronounced that the chief object in forming many irrigation districts has been to issue bonds. Regardless of whether this advantage is more or less important than it was several decades ago, it still is a material consideration in the selection of a type of organization for irrigation development, to the extent that funds of private investors are available for this purpose.

#### PUBLIC FINANCING

Financing by Federal agencies was important during the depression and the subsequent recovery. Some original financing of bonds was done by the Federal Government, but the refinancing program of the Reconstruction Finance Corporation had a far greater effect. Many districts bettered their financial positions substantially by taking advantage of this program. However, the program was not confined solely to district irrigation enterprises; it included mutual companies as well.

The policy of the Bureau of Reclamation of preferring to contract with taxing districts rather than with mutual companies for the repayment of Federal investments in reclamation projects, which long antedated the depression, is an advantage of the district form of organization. A few districts have contracted also

with the Office of Indian Affairs. Irrigation districts also have been financed and refinanced by the governments of several States. However, districts have not had access to the facilities of the Farm Credit Administration. But, generally speaking, the district has been the preferred type of organization in financial dealings with various government agencies, bond houses, and individual investors.

#### MUTUAL IRRIGATION COMPANIES

##### CORPORATIONS

Mutual irrigation corporations have usually found the markets for their bonds more limited and localized than have irrigation districts. Their issues have been fewer and in the aggregate considerably smaller. In some cases, they have obtained money on terms apparently as favorable as they could have obtained by reorganizing as districts. In others they have had to pay more for their credit than comparable districts. Mutual companies have obtained loans from the banks for cooperatives of the Farm Credit Administration at lower rates of interest than their outstanding bonds have carried. Also some mutual companies as well as irrigation districts have refinanced portions of their indebtedness through the facilities of the Reconstruction Finance Corporation. Originally, water users' associations were the contracting agencies on Federal reclamation projects, but they have not been so favored by the Bureau of Reclamation for many years.

##### UNINCORPORATED ASSOCIATIONS

In financing irrigation enterprises, unincorporated associations lack the advantages of incorporated companies. Disadvantages are also inherent in the legal interrelationships of the members of an unincorporated association.

#### COMMERCIAL IRRIGATION COMPANIES

On the whole, investments in enterprises of commercial companies, other than the refunding of indebtedness of developed projects, have been so unprofitable that little new capital has been available for their use for many years. Some established commercial enterprises, chiefly public utilities, were able to sell bonds during the last two or three decades, but these sales are believed to have been small. Just as the markets for mutual-company bonds have been, for a good many years, more limited than those for district bonds, so a similar comparison may be made between commercial and mutual companies.

Commercial companies, therefore, are under a serious disadvantage in that private markets for their bonds, although at one time substantial, have been limited for the last 35 years. This applies particularly to entirely new developments, for which markets now are negligible. It is doubtful whether an offering for such a purpose would receive serious consideration in any of the principal financial centers. Some developed commercial enterprises were able to sell bonds during the last third of a century for improve-

ments or for refinancing outstanding obligations, but these markets were not extensive. Also, the cost of such financing was higher than that for similar developments by irrigation districts.

Nor do commercial companies have access to Federal credit, as districts and mutual companies have had. Such credit is made available only to public organizations and to nonprofit private organizations of water users.

#### COMPARISON

So far as private-investment markets for their bonds are concerned, irrigation districts have had a substantial advantage over other types of irrigation organizations. Mutual companies generally have found the markets for their bonds more limited and localized. Commercial companies have had little new financing for years.

With respect to public financing, irrigation districts and mutual irrigation companies have shared the refinancing facilities of the Reconstruction Finance Corporation. The Bureau of Reclamation prefers to contract with irrigation districts on the Federal reclamation projects, and a few districts have contracted with the Office of Indian Affairs. Several State governments have bought bonds of irrigation districts within their borders. Mutual irrigation companies have an advantage over districts in that they are able to obtain credit from the banks for cooperatives of the Farm Credit Administration, a source that is not open to districts. Commercial companies do not have access to Federal credit.

#### REVENUE

##### IRRIGATION DISTRICTS

An outstanding advantage of irrigation districts in the matter of obtaining revenue is the power of taxation. This is especially true when the delinquent land is developed and capable of paying the tax. There may be little practical advantage in taxing raw land for which there is no demand, yet even this has been done in some cases with results beneficial to the district. The advantage of taxation is material where there is a demand for land, or where it is held by speculators, and in those States in which districts have authority to tax urban land for indirect benefits.

The procedure provided by law, and the method of spreading assessments so provided, cannot be changed to suit the needs of any particular district. The bases of assessing land vary in the several States. Some are better suited to varying agricultural conditions than others. In the timing of assessment levies and collections, districts lack the flexibility of mutual companies, and district procedures often are considered cumbersome in comparison with those of mutual companies. Districts are also at a disadvantage in the length of time required to complete foreclosures, as compared with the mutual company's more prompt foreclosure upon delinquent stock. Collections of assessments through county officials—the rule in most States—is advantageous under some circumstances but not under others.



The ability to charge tolls for the use of water, accorded by the laws of various States, is an advantage. A district that can utilize assessments or tolls, or both, to meet its obligations and operational requirements has greater flexibility than one that does not have authority to use tolls.

#### OTHER DISTRICTS

The advantage of the taxing power accrues only to certain types of districts other than irrigation districts. Those that cannot tax land to meet their bond obligations must depend on the revenue obtained for their services, such as irrigation and power. This revenue has been adequate for some of the districts but not for others. Some districts derive their revenue from charges fixed from time to time by the board of directors. These charges can be raised or lowered to meet changing conditions. Others, such as the Colorado water conservancy districts and the Nebraska public power and irrigation districts, supply their services at annual rates provided by contract between each landowner and the project. Most of the actual quantitative rates are fixed permanently by the contracts, and no provision is made for raising or lowering them.

In the long run, inflexible contract rates are usually detrimental to the financial interests of an enterprise. When costs of operation and maintenance increase, either because of unforeseen contingencies or because of a rise in the general price level, an enterprise may find it difficult to meet these costs and its debt payments from its relatively fixed annual income. Even though water users could well afford to pay higher water charges, they are generally reluctant to renegotiate their contracts at higher rates. But during periods of falling price levels, the enterprise is under pressure to lower the contract rates. If water charges prove to be higher than many water users can afford to pay, the enterprise must choose between reduction in rates on the one hand and heavy delinquency or reduction in patronage on the other. Insofar as the study discloses, no one has yet developed any system of variable contract rates, tied to some price index, that would give nontaxing districts financial flexibility comparable to that of standard irrigation districts and mutual companies.

#### MUTUAL IRRIGATION COMPANIES

##### CORPORATIONS

The procedure for levying and collecting assessments against the capital stock of a corporation must be followed strictly, but the timing of assessments and collections is flexible. This is a considerable advantage. Authority to charge tolls increases flexibility in obtaining revenue.

The assessment procedure for corporations is considered less cumbersome than that of irrigation districts. Certainly, its simplicity and the promptness with which a company can foreclose upon delinquent stock are advantageous. The delinquency records that are available in the enterprise office enable the prompt with-

holding of water from delinquent lands. This advantage accrues likewise to districts in some States.

The ratio of shares of stock to irrigated land can be fixed at a uniform figure per acre. Or it can be left to vary with the actions and needs of the members, as the organization may provide at the time of formation unless limited in its choice by preexisting local arrangements. Maladjustments have occurred, but opportunities for correction have been available to many such enterprises.

Limitations upon the amount of a single assessment, when prescribed by corporation law, may be a disadvantage. A more general and more serious disadvantage is a company's inability to obtain revenue from unstocked land within its service area. Lack of the power of taxation is disadvantageous in this and other situations in which irrigation districts have gained because they have the taxing power. Mutual companies have liens upon delinquent stock, but not upon the land on which the water is used, except in those cases in which stockholders have contracted that stock assessments should become liens against their stocked lands. This contractual lien has been a feature of Carey Act companies and of water users' associations on Federal reclamation projects. It has also been effected in the organizational structure of some other mutual companies, although this is not characteristic of the mutual-company type of organization.

#### UNINCORPORATED ASSOCIATIONS

An unincorporated association must resort to court action to collect unpaid operating charges. It thus lacks the substantial advantages of a corporation in the matter of collecting revenue from delinquent members.

#### COMMERCIAL IRRIGATION COMPANIES

Commercial irrigation companies share with mutual irrigation companies the disadvantage of being unable to obtain revenue from lands within their service areas that are owned by persons who refuse to patronize the enterprise. Another disadvantage of commercial companies lies in the fact that the owners of the system and the water users, who are not identical, may have conflicting interests.

#### DEVELOPMENT COMPANIES

The purpose of development companies was such that revenue from operation of the systems prior to their disposal to permanent operating organizations was incidental.

#### PRIVATE-CONTRACT COMPANIES

As costs of operation mounted, private-contract companies, that operated with annual charges fixed by contract and not subject to change without the consent of the water users, were under an increasing disadvantage. Many of these companies began operating under this handicap, which although now evident, apparently was not foreseen in the beginning. Most of them went out of business; they were succeeded by water-user enterprises, public or

private. In those cases in which upward revisions of annual charges were possible, either by agreement of the water users or because the companies were held to be engaged in public service notwithstanding their contracts, the companies were better able to meet changing economic conditions. This was true also in those cases in which the contracts provided for payment by the water users of their proportionate share of the actual costs. The history of these companies has made evident the serious disadvantage of a permanent operating charge fixed by contract.

#### PUBLIC-UTILITY COMPANIES

Public utilities subject to public regulation are entitled to charge rates high enough to pay their proper annual costs, although in many situations they have been precluded from taking advantage of this legal right because of economic or psychological considerations. Lack of substantial dividend payments by so many public-utility irrigation companies is an indication of a general lack of adequate revenue on their part. A standby charge, coupled with a dependable water supply, has helped to smooth out the fluctuations in annual income that have adversely affected some of these enterprises.

#### COMPARISON

The power of taxation is an outstanding advantage in obtaining revenue; organizations that do not have this power must rely upon revenue from toll charges, stock assessments, or individual contracts. Irrigation districts and districts of certain other types have the power of taxation. Districts of still other types, and mutual and commercial irrigation companies, which are private entities, do not have this power.

The procedure for levying assessments against lands by irrigation districts is considered cumbersome and the length of time required to complete foreclosures a disadvantage. The stock-assessment procedure of mutual irrigation companies is less cumbersome and a good deal speedier. It has the advantage of flexibility in the timing of assessments and collections. Commercial companies that operate with annual charges fixed by contract are at a disadvantage in times of rising prices. Public utilities subject to public regulation have had the legal right to make charges high enough to cover their necessities, but in many cases they have been forestalled because of uncontrollable circumstances.

An advantage of irrigation districts and mutual companies over commercial irrigation companies is that the owners of the system and the water users are identical or substantially so, whereas in the case of commercial irrigation companies the two groups are not identical and may have conflicting interests.

#### ALLOCATIONS OF WATER PRIVILEGES

In the acquisition and exercise of a water right, no organization of any type occupies a preferential position over one of any other type, so far as State water-right laws are concerned.

Allocation of water privileges by any irrigation enterprise must



conform to the limitations of the State water law, the character of the water rights involved, and any provisions for apportionment of water that are prescribed in the statute under which the enterprise is organized.

Some irrigation-district statutes prescribe for the district taxing entities the basis of apportionment of the water they serve. In some States this basis is flexible. No restrictions are placed upon apportionment of water in the statutes under which the nontaxing districts, mutual companies, and commercial companies studied were formed. To whatever extent an irrigation district is restricted by its organic law in allocating water privileges to lands that may have varying water requirements, the enterprise is at a disadvantage in comparison with enterprises not so restricted.

In some situations, it may be desirable or even necessary to have water-service privileges established by voluntary agreement rather than by involuntary inclusion within a standard irrigation district. One type of situation, illustrated by one of the Nebraska public power and irrigation districts studied, is the establishment of a new irrigation project in a subhumid area in which a fairly satisfactory type of dryland agriculture had developed. Many landowners, who are unfamiliar with irrigation, may resent at first any type of organization and financing scheme that would force them to change over to irrigation or to pay irrigation taxes whether or not they use water. Voluntary water contracts and water charges applicable only to contracted acreage may be the only solution possible.

A second type of situation is illustrated by the Colorado water conservancy district included in the present study. The purpose of this project is to supply supplemental water to a considerable area already served by many primary- and supplemental-supply systems, most of which are operated by mutual companies. The need for additional supplemental water varies widely among the various canal systems and even among the water users under each canal. Use of voluntary water-service contracts permits the water users, either individually or by local groups, to determine for themselves the amount of project water they will take and pay for. Presumably, this flexibility in water service could have been achieved by a mutual-company type of organization. In fact, a mutual company was organized during the planning phase, but it was early decided that such a company was inadequate to finance an undertaking of the magnitude contemplated and the water-conservancy district was organized instead.

#### EXEMPTIONS FROM TAXATION

Districts have advantages in total exemption from payment of the Federal income tax, and in exemption of their bonds from Federal income taxation. Mutual companies are exempted if 85 per cent or more of their income is collected from members to meet losses and expenses; their bonds are not tax-exempt. Commercial companies are not exempted from the Federal income tax.

Some States exempt the property of irrigation districts from taxation in greater or less degree. Mutual companies are exempted

from taxation in some States and not in others; in some States mutual irrigation corporations have special exemptions with respect to franchise taxes. Irrigation works of commercial companies are exempted from taxation in at least one State, although this is apparently exceptional. In the matter of tax exemptions, nonprofit enterprises are the most favored by the States.

When it comes to taxation, commercial companies, as a rule, are at more of a disadvantage than either districts or mutual companies. The amount of taxes that some commercial companies have been required to pay has been a significant item in the cost of operation of their projects. This disadvantage, which is inherent in the fundamental nature of a commercial irrigation company—a private enterprise for profit—has been an important consideration in the operation of some projects.

### ATTITUDE OF WATER USERS

Attitudes of water users toward the organization that serves them, and toward its management, have been more generally favorable on district and mutual-company enterprises than with commercial companies. This has been influenced by the fact that in only the former cases do the water users control the policies of the organization. At times conflicts in interest have arisen between commercial companies and their consumers as a whole. These conflicts have resulted in a generally unfavorable attitude on the part of the water users. Internal controversies in district and mutual-company enterprises are more likely to arise between a minority group of users on the one hand and the management and controlling majority of users on the other. Much of the contention between commercial companies and consumers has been because of water rates, although some of it has been owing to other causes. Dissatisfaction of water users with the commercial companies that serve them has not been universal, but it has been noted in a larger proportion of commercial companies than of either districts or mutual companies.

On the whole, districts and mutual companies have some advantage over commercial companies as regards the attitudes of their water users. The measure of this advantage, when it has existed, has varied considerably. Unfavorable attitudes of water users have been manifested in some cases solely by chronic complaints and lack of cordiality; in other instances they have proved expensive to the organization.

### OTHER TOPICS

#### PUBLIC SUPERVISION OF ENTERPRISE ACTIVITIES

Requirements of the several States with respect to supervision over the activities of irrigation enterprises cover a wide range. After organizing, districts in various States are required to make annual reports to some State agency and are subject to more or less supervision over their financing. Financing of mutual companies is subject to the "blue-sky laws." Public-utility companies are also

supervised in greater or less degree in matters of rates, services, and bond issues; in some States they are required to make detailed reports of their financial operations.

Public supervision, which is intended to protect the public from the adverse effects of unsound enterprises, is considered bothersome by the officers of some organizations but not by officers of others. Some officers mention the amount of detailed work involved; others say that it adds little to their duties.

#### EMINENT DOMAIN

Irrigation districts usually have the power of eminent domain. The extent to which this authority is granted to private enterprises varies in the several jurisdictions. To whatever extent a type of irrigation organization has the power of eminent domain, it has an advantage over types not so favored.

#### OVERHEAD

Tax payments, as previously noted, have been substantial items of overhead of some organizations required to pay them. This applies more generally to commercial companies than to other irrigation organizations, but other items of overhead may be important. Payment of dividends from profits likewise enters (theoretically in some cases, actually in others) into the overhead of commercial companies, and not into that of nonprofit enterprises. It is true that many companies have been unable to pay substantial dividends, and that probably many have paid none, but the incentive is present. Also, the rates of public utilities are so fixed as to include a return on the company's investment in those cases in which it is believed that consumers are able to pay such rates. Other things being equal, higher salaries may be paid in the management of companies that expect to make profits and pay dividends than in the case of enterprises that operate at cost, and so to that extent the overhead is further increased. In these respects, therefore, irrigation districts and mutual companies have an advantage over commercial irrigation companies.

#### AVAILABILITY OF PUBLIC RECORDS

Availability of public records of assessments and other financial transactions is valuable to parties interested in particular lands served by an irrigation enterprise, and in its affairs generally. Interested parties may include, for example, loan agencies, agricultural officials, and the farmers themselves.

In this respect, the greatest convenience probably comes from having the records of irrigation districts available at the county court house. This is the case in a majority of the Western States, in which district tax collections are made through county officials. The district office frequently is located at some place other than the county seat. However, a complete, up-to-date set of records in the office of the enterprise is convenient and advantageous to its officers.



## ADAPTABILITY OF TYPE OF ORGANIZATION TO ENTERPRISES STUDIED

One point of inquiry for each enterprise studied was:

On the whole, would any other type of organization have given better results?

The views of local parties who were interviewed with respect to this question were definite in some cases. In other cases, they were neither conclusive nor satisfactory. This probably is natural; under some circumstances the question as to whether another kind of organization would have done better with a given irrigation project may well be debatable. This is particularly the case when a project is operated with reasonable efficiency and gives adequate service at reasonable cost, or when the serious troubles of an enterprise might have happened under any form of organization. For example, water-supply difficulties have been common to many enterprises of all kinds. Two unrelated enterprises—an irrigation district and a commercial irrigation company—invested large sums in water-development undertakings, the full development of which was successfully opposed by means of court proceedings. In each case the result was a water supply materially less than that on which the investment had been predicated. The irrigated area served by each necessarily was curtailed, and the finances of the enterprises suffered. There is no reason to think that in either case a mutual company would have had a less unhappy experience.

Irrigation districts have defaulted in the payment of indebtedness more often than mutual companies, but bond issues of districts have been more numerous and in the aggregate much larger. Therefore, the possibilities of default have been correspondingly greater. Furthermore, if all the facts could be ascertained, it is possible that the difference between present values and total investments in many mutual irrigation-company enterprises would be found to be equivalent to heavy default or financial failure. The fact that a particular organization suffered a default is not considered, in itself, a basis for concluding that some other type would have done better. In an individual case this fact probably should be taken into consideration, together with all other circumstances, in arriving at an answer to the question, but it is not considered as controlling.

Answers to this question and the resulting conclusions as to adaptability of types of organizations to the conditions of the enterprises studied are based upon (1) views of local people only to the extent that those views appeared to be well supported, and (2) careful consideration of the differing characteristics of the several types of organization and the performance of each organization in its own environment, so far as data concerning it were obtainable.

The ensuing discussion of adaptability of types of organization is based solely upon the performance of the enterprises canvassed in the present study, and not upon those of any other organizations or studies cited in this report.

## IRRIGATION DISTRICTS

For the purposes of those enterprises for which it was used, the irrigation district form of organization generally appeared to be suitable. In many cases, the results achieved under districts were apparently as good as could have been obtained under an organization of any other type. Doubts were confined to only a few of the districts; and for only one was it definitely indicated that another type would have been preferable.

The unqualified conclusion with respect to 15 irrigation districts was that no other type of organization would have given better results. The district was not necessarily considered the most suitable type of organization for all of these enterprises. For some it was considered that a mutual irrigation company might have been equally suitable, although not more so.

The chief basis for the favorable conclusion with respect to a large proportion of the districts was the ability of such an organization to finance its undertaking through the sale of bonds. In many of these cases no other kind of organization could have sold bonds on the scale desired. Some of the organizations that preceded these districts had been unable to finance the proposed improvements and had been replaced by irrigation districts primarily to finance them. Some other districts that required large bond issues were formed for new development. There was a market for the district bonds, but not for mutual-company bonds in the amounts proposed, and capital was no longer available for extensive commercial enterprises.

The preference of the Bureau of Reclamation for irrigation districts as contracting agencies on Federal reclamation projects was stressed in connection with districts that had been formed for that purpose. Four of the districts studied had been organized to take over the functions of preexisting water users' associations. They had done as well as, and in some respects better than, the predecessor companies. Two of them had proved their value in forcing collection of delinquent assessments and thereby encouraging more rapid development of farm lands. An early difficulty in these two cases was the slowness with which lands were brought under cultivation.

Other situations in which irrigation districts were considered to have operated with greater success than other organizations were cases in which district tax machinery was able to smooth out inequalities in water services and payments, and in which collections under the county tax procedure involved less overhead than otherwise would have been the case.

Although the district organization was generally considered satisfactory, questions as to its superiority were raised in some cases. In the case of one district, which had defaulted because of accumulated delinquencies during the depression of the 1930's, it was intimated that a privately owned company with a collection policy adaptable to the circumstances of individual water users—strict with those able to pay, and lenient with others—might have recovered most or all of the past-due income when conditions even-



tually improved. The greater flexibility of the mutual-company type of organization was stressed in another case, but was outweighed by two circumstances—the district's ability to sell bonds at a time when mutual-company bonds in such amount were not marketable, and its ability later to contract with the Bureau of Reclamation for refinancing and reconstruction.

#### OTHER DISTRICTS

The water district studied had given good performance under favorable conditions during the 3 years of its operation. No basis was yet apparent for concluding that some other type of organization would have been more suitable.

So far as the electrical district was concerned, it was considered that "perhaps" some other organization would have given better results. A mutual irrigation company, if it could have been financed to distribute electric energy to water users willing to buy stock in an enterprise of that character, might have resulted in a sounder and more conservative development and more efficient utilization of the ground-water supply, though possibly at a higher rate for the service rendered.

Neither of the public power and irrigation districts in the study was believed to be the best type of organization for irrigation service in the area in which it was used. If enough local support for its formation could have been obtained, an irrigation district probably would have done better in either case. An organization of this kind might have avoided the default that occurred in one of these cases. Costs would have been spread in the form of taxation instead of the inflexible rates fixed by permanent water contracts which yielded insufficient income during the World War II and postwar periods. For the other enterprise, a standard irrigation district might have operated more efficiently by avoiding the multiplicity of services and charges assumed by the irrigation division of the public power and irrigation district from the predecessor commercial company—provided elimination of these differentials had been feasible. However, this present organization had done better with the irrigation system and its operation than the predecessor commercial company had done.

The water conservancy district was believed to be the best type of organization for this particular supplemental-supply project. Use of voluntary water contracts with individual water users and groups provided the needed flexibility in water service. Making the annual charges fixed by these contracts perpetual tax liens against the contracted lands provided the necessary security to enable the district to contract with the Bureau of Reclamation for the repayment of project costs. Use of the general taxing power makes it possible to obtain some contribution from various groups of indirect beneficiaries. Although property taxes account for only a small part of the total annual income of the district, actually it was this that tipped the scales to make the project appear financially feasible at the start. Moreover, use of tax receipts is expected to provide some measure of financial flexibility in the future,



offsetting to some extent the inflexibility that stems from fixed water charges established in the water-service contracts.

### MUTUAL IRRIGATION COMPANIES

Mutual companies appeared to be generally well adapted to the situations in which they were used. The study indicated that some modifications of existing arrangements would be desirable, for example, assumption by the company of control over lateral ditches. However, this was not a valid criticism of the mutual company as a type of organization as various organizations of all types control only the main canals. It simply pointed to a needed improvement in policy and practice of operation, which would have been equally needed and could have been equally well achieved under any other form of organization.

For 12 of the 17 mutual irrigation companies, the answer to the question as to whether better results would have been obtained under any other type of organization was unqualifiedly "no." It was generally concluded that these organizations were suited to their respective environments, and that they had done as well as organizations of any other type could have done. Two of the companies had succeeded irrigation districts, and obtained more satisfactory results than had the predecessor districts.

Other things stressed in connection with the advantages of the mutual company, were generally satisfactory performance by such companies in the region, their good reputation, and preference of local farmers for that type of organization. The ease with which the nonstock corporation studied had been formed was considered advantageous to the organizers in that there was no need for a formal election or stock-subscription campaign.

Elements that particularly favored the mutual-company type of organization were greater flexibility of operation; preference of water users for mutual companies; and the peculiar adaptability of a land and water development company—with a mutual company, eventually controlled by the water users, as the agency for operating the system—to the colonization and settlement of an irrigation enterprise.

In several cases local persons did not give unqualified approval to mutual companies, but considered it "apparent" or "probable" that no other type of organization would have done better. In some instances, the circumstances relating to the whole area were not favorable, but the mutual companies were doing neither better nor worse than irrigation districts would have done under similar circumstances. All in all, mutual companies appeared to be favorably adapted to the enterprises for which they were used.

### COMMERCIAL IRRIGATION COMPANIES

Results of the inquiry showed that for the projects studied commercial companies were, on the whole, less satisfactory than the other types of irrigation organizations. In no case was it stated unqualifiedly that no other type of organization would have given better results; on the contrary, for three companies the answer

was "yes." In some other cases, positive conclusions one way or the other were rather difficult to reach.

Some commercial irrigation companies had had serious difficulties which apparently were not inherent in the type of organization. For example, one company had been involved in a complicated reorganization of irrigation interests in the area—an intensive citrus-producing region in southern California—in which factionalism and personalities played a considerable part. The various transactions left the owners of the enterprise with an inefficient irrigation system, which was both unprofitable for them and costly for the water users. The predecessor of another company had been disappointed in the anticipated water supply which had cost a great deal of money. This organization was unhappy in its public relations. A water users' organization might have been more successful in that respect; but whether it would have solved the water-supply problem more satisfactorily is open to question.

In the case of one project it was indicated that a district or a mutual company might afford lower water rates. At the same time it was emphasized that comparable irrigation districts in the area had defaulted and had been refinanced at losses to the creditors during the depression of the 1930's, whereas in the case of this company the heavy delinquencies in rate payments were practically all paid off when economic conditions improved. Another company was operating under rates fixed in perpetual contracts which had proved too low for satisfactory service. It was believed that perhaps a mutual company or a district could have given better results because of its ability to increase the water charges whenever necessary. Had the company been engaged in public service subject to rate regulation, an increase might have been effected. But the process would doubtless have been slower and resistance greater and, in the light of experience of many other public-utility irrigation companies, the desired result problematical.

With respect to three commercial companies the conclusion was that some other form of organization would have given better results. Considerable friction, which might well have been less under a water users' organization, had marked the relations between one of these companies and its consumers. Furthermore, under a mutual company the cost would have been less because of the resulting lower overhead and absence of the element of profit.

In another case, the absence of dividends and taxes, which are incident to the operations of a commercial company, would have made the cost under a district or a mutual company lower.

The third company in this group served an area that had been greatly reduced because of the formation of two districts by groups of farmer consumers and the acquisition by such districts of parts of the company's irrigation system. The change to the district form of organization in those areas came about because of a growing dissatisfaction with the commercial company service and with water charges as applied to the prevailing types of agriculture. The operating advantages of an irrigation district—such as exemption from taxation, and better feeling on the part of the farmers—contributed to a local feeling that eventually the remainder of the



system also would probably be brought under the district form of organization.

### SUMMARY OF PROBABLE RESULTS UNDER OTHER TYPES OF ORGANIZATION

Irrigation districts and mutual irrigation companies in the present study appeared to be generally well adapted to the purposes for which they were used. On the larger number of these projects results were considered to have been as good as could have been obtained by organizations of any other type. Questions as to the superiority of the existing type were raised in some cases, more so with districts than with mutual companies, although on several projects it was contended locally that mutual companies could not have accomplished what the districts had done, particularly in financing the developments. Only one district was considered actually unsuited to prevailing local conditions. Two mutual-company projects, for which the companies were probably doing as well under existing conditions as any other local organization could have done, would have been better served by comprehensive, valley-wide organizations.

The water district was believed to have done as well as any other organization could have done. This was questioned as to the electrical district. Neither of the public power and irrigation districts was believed to be the best type of organization for irrigation service in its area. The water conservancy district apparently was the best type of organization known, in view of the particular situation on this project.

On the whole, commercial irrigation companies were less suited than irrigation districts and mutual companies to their respective local conditions. Positive conclusions in some cases were difficult to reach. However, it was concluded that in most cases, types of organization other than commercial would have served at least as well for purposes other than making profits from sale of water or of land and water; also that in three instances, at least from the standpoint of the water users, some other type of irrigation organization would have been preferable.

### SUCCESS OR FAILURE OF IRRIGATION ENTERPRISES

#### MEANING OF SUCCESS OR FAILURE

Judging the success or failure of an irrigation enterprise depends upon the criteria used. Perhaps the more common criterion is that of financial success or failure, by which is meant whether the enterprise has met its financial obligations successfully or has paid its costs of construction.

Another criterion, however, is that of the success of the farming community that is served by the enterprise. In many cases, irrigation enterprises have "failed" from the standpoint of repaying the full costs of development, but after writing off part of their



financial obligations have resulted in prosperous irrigated areas and sound and efficient irrigation systems. Benefits to water users and to the public may exceed the financial loss suffered by those who supply the investment capital, whether private or public. From the one point of view, then, the enterprise eventually became successful, but those who provided the capital to build the works and who expected repayment in full did not share in its success.

A third possible criterion as to the success of an enterprise might be that of the efficiency with which the organization supplies water to its users. Two enterprises might be equally successful in meeting financial obligations and in developing prosperous communities, but one might operate much more efficiently, smoothly, and harmoniously than the other.

#### FACTORS THAT INFLUENCE FINANCIAL SUCCESS OR FAILURE

Probably the main factor that has to do with success or failure of an irrigation enterprise in meeting its financial obligations is the cost of obtaining and delivering the irrigation water in relation to how much the users can afford to pay for it. If the users can afford to pay the full cost of the water, the enterprise usually will be successful financially—unless it is mismanaged—regardless of the type of organization. But if the cost of water to the users greatly exceeds its value to them, financial failure is inevitable, whatever may be the type of irrigation organization.

#### RELATION BETWEEN COSTS AND BENEFITS OF WATER

The significant point in determining financial success or failure is the cost of the water to the users relative to the benefits obtained from it. When benefits from water served by two projects are comparable, but costs to users differ substantially, users under the lower-cost project may be able to pay the annual charges during a particular period of low farm prices when the users under the higher-cost project are unable to pay them. A project having high costs, but also high benefits, may be able to meet its obligations at a time when a lower-cost project with low benefits fails to do so. These relationships seem self-evident, but in discussing the elements of success and failure in irrigation, they are sometimes overlooked.

To illustrate, two districts studied had comparable agriculture. In the case of the lower-cost district the cost did not exceed the benefits, even when returns from fruit growing were low; so the district was financially successful. The higher cost of the other project was more than the users could afford to pay during that period, with the result that the district was granted concessions by its creditors and so was classed as financially unsuccessful. But the high cost of the water provided by one of the mutual companies studied did not exceed the benefits and was carried safely throughout the depression period. In another mutual-company project the farm returns were such that the company was not able to meet its obligations in full as due, even with the cost of water relatively low.

## COSTS OF IRRIGATION WATER

Costs to which this discussion relates are those incurred by an enterprise in obtaining and distributing water for irrigation. These costs are passed on to the water users or others benefited by the project as annual charges in the form of assessments against land or capital stock, toll charges for the use of water, payments upon contracts, or public-utility rates, as the case may be.<sup>43</sup> Both capital costs and operating costs are thus involved. The total project costs that must be met each year are charged in the first instance to the enterprise organization, and then are apportioned upon one basis or another to those to whom the benefits accrue.

## FIXED AND VARIABLE CHARGES FOR WATER

That part of a project's total annual water charge which represents repayment upon indebtedness is sometimes termed a "fixed charge." It becomes established when the indebtedness is incurred; it must be met regardless of the proportion of the total area that is irrigated; and it cannot be lowered by efficiency in management or economy of operation and maintenance. Payments of principal and interest upon indebtedness have sometimes been scheduled for only a few years. But in many cases the periods have extended for 20 to 40 years; and except in those cases in which annual repayments of Federal reclamation costs have been made to depend in part upon annual gross crop returns, the schedule is inflexible. The annual payment may be approximately uniform from year to year or it may be low during the first part of the repayment period and high during the latter part. In any event, it is determined when the financing is arranged, for each year of the period during which the debt is to run.

The depreciation charge is also fixed to take care of renewals of works subject to deterioration, which is included in the accounting practices of some irrigation organizations. Many organizations, however—particularly those having earthen canals and concrete structures, but also many with depreciable works—do not carry depreciation on their books. They make replacements as needed and pay for them from current income or from new borrowings.<sup>44</sup>

The project's charge for the cost of operation and maintenance—which may constitute the total annual charge or may be either a large or a small part of it—is a variable charge. Variability results from both external and internal influences; for example, from changes in costs of labor and material; accumulation of deferred maintenance, which usually is permissible to some extent, depending upon the condition of the irrigation system; and existence of opportunities for sound economies. Many enterprises have allowed deferred maintenance to accumulate in times of stress; others have economized in one way or another at such times. How-

<sup>43</sup> Other irrigation costs incurred by farmers, such as costs of applying water to the soil or maintenance of farm ditches, are not included.

<sup>44</sup> The practices of a number of mutual companies with respect to depreciation are described in a study of such companies (16, pp. 132-134).



ever, the system must be operated and reasonably well maintained if the users are to receive water. Therefore, if operation is to continue the necessary costs must be met, regardless of economic conditions. In other words, although the extent to which the cost of operation and maintenance can be lowered is limited, this part of the project's annual water charge is sufficiently flexible to permit the management to adjust it in greater or less degree from year to year to meet the needs of the system and the circumstances of those to whom the charges are apportioned.

Fixed charges, then, relate chiefly to repayment of project obligations. They frequently extend over many years. During the repayment period, the level of farm income may change materially. Some changes that have occurred in the level of farm income have been of such magnitude as to impair the ability of the water users to meet the charges against them and consequently the ability of the project to meet its financial obligations.

#### FACTORS THAT AFFECT CONSTRUCTION COSTS

Early irrigation enterprises usually constructed their systems at low costs, because the lands they served were located near streams, from which water was diverted with inexpensive works and conveyed and distributed to the farms through short ditches. Later, some enterprises had to replace their diversion works with more substantial structures, and many new ones had to bring their water from greater distances and sometimes over more difficult topography, necessarily at higher cost. As the natural flows of streams during the irrigation season were more and more largely appropriated over the years, the supplies of surface water available for further development became chiefly the early season flood flows. Construction of storage dams and reservoirs was necessary. Thus the progress of irrigation development has carried the element of generally increasing costs for obtaining water supplies adequate for full crop production—even aside from changes in the level of construction costs.

The capital cost of a particular irrigation enterprise may be considerably higher if constructed at one time than at another. Construction costs necessarily depend upon prices of labor and materials at the time the work is done. This factor has influenced the performance of some enterprises in meeting their financial obligations. Some enterprises that constructed works at the peak of construction costs suffered from the effects of subsequent declines in farm-commodity prices, and this impaired the ability of the water users to pay the fixed charges imposed upon them as a result of the capital costs.

Ultimate investments in facilities of some projects have been higher than originally planned. Many enterprises have improved their water supplies by acquiring supplemental supplies, necessarily at added cost, but with accompanying increases in benefits. Exceptional circumstances, such as flood disasters, have added to the original costs of some systems. Furthermore, some organizations have acquired title to the distribution systems within their



service areas, theretofore locally owned and operated, in some cases for compensation.<sup>45</sup>

#### RELATION BETWEEN INDEBTEDNESS AND ANNUAL CHARGES

Projects built at high cost with capital borrowed from private sources usually have high annual water charges during the period of repayment. This is not only because of the debt-service charge; it is also because expensive systems usually entail high costs of operation and maintenance.

Spreading the payments over a long series of years necessarily reduces the annual debt-service charge.<sup>46</sup> For example, if an enterprise should borrow money for construction purposes, averaging, say, \$100 an acre and should undertake to retire the bonds at 6-percent interest within 10 years, an annual charge of about \$13.60 per acre would be required to amortize the debt. If the period is 20 years, the annual charge would be lowered to about \$8.70 an acre, and if lengthened to 40 years, to only \$6.65 an acre. (Interest-free money, by contrast, would mean an annual charge of only \$2.50 an acre to repay the debt during a 40-year period.) But if the enterprise should borrow only \$10 an acre and undertake to pay the entire debt at the end of a year at 6-percent interest, its cost for that one year would be slightly higher than would be the annual charge on a \$100 debt amortized at 6 percent during a period of 15 years.

In practice, the \$100 projects usually obtain long periods for the repayment of their debts, and the \$10 projects either long or short periods, depending upon their anticipated ability to pay the resulting annual charges.

*Enterprises having interest-bearing debts.*—The relationships, as of 1945, between outstanding indebtedness and annual water charges of 28 enterprises having interest-bearing debts,<sup>47</sup> based upon average indebtedness and average water charges per irrigated acre for each enterprise, are shown in table 3.

Because of the peculiar circumstances of these individual projects, a satisfactory correlation between their indebtedness and

<sup>45</sup> Where water users were thus reimbursed for the actual costs of their local systems, the total capital cost of the project was not thereby increased, although financial rearrangements necessarily resulted. In some cases these rearrangements were minor; in others they were of considerable proportions. An example of a large-scale transaction of this character is the acquisition by the Imperial Irrigation District, Calif., of the mutual-company distribution systems within its boundaries, at a total cost of about \$4,725,000, about 6 years after it had acquired the main canal system at a price of \$3,000,000. This transaction and the financial adjustments that it entailed are discussed in a study of irrigation districts in California (1, pp. 336-337, 342, 344); and the reasons for it are given in a study of mutual companies in California and Utah (16, pp. 64-65).

<sup>46</sup> The terms on which irrigation districts are authorized to issue bonds are prescribed in the several State irrigation-district statutes; they vary considerably from State to State.

<sup>47</sup> These comprise 13 irrigation districts, 4 districts of other types, 8 mutual irrigation companies, and 3 commercial irrigation companies. Districts indebted chiefly to the United States on account of Federal reclamation construction contracts are excluded from this comparison because of the interest-free feature of such indebtedness.

TABLE 3.—*Average water charge per acre by amount of indebtedness, 28 selected enterprises, 1945*

Indebtedness per acre	Enter- prises	Average water charge per acre
	<i>Number</i>	<i>Dollars</i>
Under \$30.....	21	3.30
\$31 to \$60.....	5	12.42
More than \$60.....	2	31.14

water charges is attainable only with the use of wide ranges in indebtedness. That is, the debts of the 21 enterprises in the lowest debt group ranged from \$0.37 to \$26.04 and their 1945 water charges from \$0.23 to \$7.88 per irrigated acre; but the enterprise with the lowest debt and that with the highest debt had almost identical water charges—\$2.10 and \$2.00 per acre, respectively.<sup>48</sup> The five enterprises in the \$31 to \$60 debt group had debts that ranged from \$41.37 to \$58.19 an acre, but their water charges for 1945 varied from \$2.50 to \$30.00 an acre. In the highest debt group, one enterprise had a debt of \$93.50 and a water charge of \$32.45 an acre, and the other a debt of \$109.12 and a water charge of \$29.82.

*Enterprises having no indebtedness.*—For 15 enterprises that had no indebtedness in 1945, water charges in that year ranged from \$0.06 to \$23.90 and averaged \$5.36 per irrigated acre. The number of enterprises and the average water charge for different ranges in water charges are shown in table 4.

TABLE 4.—*Average water charge per acre, 15 enterprises having no indebtedness, 1945*

Range in water charge per acre	Enter- prises	Average water charge per acre
	<i>Number</i>	<i>Dollars</i>
Under \$1.....	5	0.56
\$1 to \$2.....	4	1.73
\$2 to \$10.....	3	4.17
More than \$10.....	3	19.37

## RELATION BETWEEN ANNUAL WATER CHARGE AND TYPE OF AGRICULTURE

Table 5 shows the relation between the 1945 water charges per acre of 52 enterprises and the type of agriculture in their respective service areas. The enterprises in the lowest group of less than \$5 comprise nearly five-eighths of the total; with only two exceptions, they were extensive-farming enterprises. Those of the high-

<sup>48</sup> Fifteen of the 21 enterprises had debts of less than \$10 an acre. The 15 included the two enterprises having the lowest and the highest water charges.

est group of \$15 and more all served intensively farmed lands that yielded high-return crops. Those in the intermediate group were divided nearly equally between extensive and intensive farming.

TABLE 5.—*Relation between water charge and type of agriculture*

Water charge per acre	Enterprises	
	Extensive farming	Intensive farming
	<i>Number</i>	<i>Number</i>
Under \$5.....	30	2
\$5 to \$14.....	8	7
\$15 and more.....	0	5

In considering the relationship between costs and benefits of water, the annual charge, rather than the capital-investment cost, controls the classification of high- and low-cost projects. This is true, even though the annual charge, as previously noted, is determined in large part by capital expenditures upon which payments of principal and interest or dividends must be made and by the schedule of repayment of indebtedness. The highest-cost projects, so classified, tend to be associated with high-return, intensive-farming developments, and the lowest-cost projects with those having extensive farming and relatively low net returns. This is not always the case; some intensive-farming enterprises have moderate costs comparable to those of some extensive-farming projects.<sup>49</sup> That is to say, high costs of water do not necessarily follow from intensive farming; but high returns from farming are necessary to carry high water charges, and projects that are physically feasible only with high annual charges can be financially feasible only if the farm returns are relatively high.

Careful planning and financing necessarily take into account the relation between allowable costs and expected returns from farming. Except during grossly speculative periods, even many unduly optimistic promoters have had to consider it. The difficulty has been that in many cases either a safe relationship was not provided for, or subsequent events altered what at the time of financing appeared to be a safe relationship. In such cases, the costs that were incurred proved to be too high in relation to the benefits that materialized.

#### REASONABLENESS OF COSTS OF WATER

The cost factor of a financially successful irrigation enterprise is sometimes spoken of as a reasonable cost. Reasonableness is a relative term—it relates to and depends upon something else, which in this case is the ability of the users to pay the cost of the water.

<sup>49</sup> For example, 5 intensive-farming enterprises had 1945 water charges of \$5 to \$7 an acre, while 7 extensive-farming enterprises had charges of \$7 to \$9 an acre.



It implies a safe relationship between cost and benefit. As used in this connection, a particular cost of water may be reasonable under the circumstances of one project, while a lower cost may not be reasonable under those of another. For a given project, the same cost may be reasonable at one time and too high at another.

The high cost of one citrus-producing enterprise studied, which had high returns, proved reasonable under the local circumstances even during the depression of the 1930's. But a much lower cost proved excessive under the circumstances of another project in which deciduous fruits and general farm crops were produced.

High returns from citrus groves have not always succeeded in making high costs reasonable. For example, two citrus-producing projects in the present study that had water costs of around \$25 an acre did not default; whereas another project in which 93 percent of the irrigated area was in citrus and the remainder mainly in vines and truck crops, and which had a cost somewhat in excess of \$30 an acre, failed to meet its bond payments during the depression. The cost differential alone did not account for the fact that the third enterprise defaulted and the others did not, as other circumstances contributed to the unreasonableness of the cost under the third enterprise during the depression.

Still another enterprise which served chiefly field-crop, dairy, and livestock farms, had an annual cost of \$3.50 per acre, which under many circumstances would be considered moderate. But although this charge appeared reasonable enough when times were good, it proved to be too high for the circumstances of that project during the depression.

#### BENEFITS FROM IRRIGATION WATER

Direct benefits from an irrigation project are derived from application of the water served by the project to the farm land, production or increase in production of crops resulting from the use of the water, and returns from the crops so produced. Land, water, and production and value of the crops are factors in the realization of the irrigation benefit; and the amount of the benefit varies with their quantity or quality as the case may be. Various other factors, such as efficiency in irrigating and farming, also affect the amount of the benefit. This discussion is confined to the principal elements disclosed by the study upon which this report is based. The question of indirect benefits is also excluded from the discussion.

#### LAND AND WATER

It is often said that the success of an irrigation enterprise is determined principally by good land and an adequate supply of water. These factors are meaningless aside from their relation to the cost of the water. They are elements of the benefit and, as previously noted, the relation of costs and benefits is probably the chief factor in determining the financial success or failure of a project. Neither the cost alone, nor the benefit alone, can determine that.

A project with poor land and an inadequate supply of water for full crop production, but with a low-enough water cost, may be more successful in meeting its obligations as they fall due than a

project with good land, plenty of water, but an unduly high cost of water. The proportion of enterprises studied that defaulted was slightly higher for those with a deficient water supply than for those with an adequate supply. But eight enterprises with deficient water supplies and poorer than average crop yields have never defaulted, and three with adequate water supplies and better than average crop yields have defaulted heavily.

#### PRODUCING LANDS

Regardless of the high productive capacity of lands and of the adequacy of water to serve them, financial success of a project may be impaired if only a small part of the area is farmed and irrigated when the obligations of the enterprise begin to mature. This does not modify the relation of costs and benefits. It means that, although the cost of construction of the irrigation system may be the same whether the entire service area or only a small part of it is in crop production, in the latter event only a small part of the total potential benefit is realized.

Slowness of settlement of land has contributed materially to the defaults of various irrigation enterprises, particularly during periods of intensive promotional activity (11, pp. 4-5 and 8-11). Irrigation districts and commercial enterprises engaged in the sale of land and "water rights" were chiefly affected. Enterprises that began and continued under the mutual-company form of organization were less subject to this difficulty because of the character of their development and financing (12, pp. 6-8; 14, pp. 8-10; 16, pp. 77-81). In some other cases, colonized lands were in large part abandoned. This added to troubles already begun. Abandonment resulted from unfavorable conditions, such as unduly high costs of water, pyramiding of assessments upon paying lands because of nonpayments from other lands, or a water supply inadequate for the entire area.

With respect to most of the enterprises studied, problems occasioned by large proportions of undeveloped land were not reported as having been serious. Although there were some exceptions, for most of those enterprises that had not defaulted, the percentage of irrigable land under irrigation at the time the study was made was high. For the majority of districts and all mutual companies that defaulted, and for several commercial companies that did not default but concerning which there were no reports of dividend payments, high percentages of irrigated land were also reported at the time of the canvass. For seven other districts that defaulted, the percentages of irrigable land usually irrigated ranged from 26 to 74; but in none of these cases was it reported that inadequacy of revenue from nonirrigated lands was a major contributing factor to the default. Two related commercial companies that had not defaulted, but that were reported as not having yielded substantial profits to their owners, were delivering water to lands which constituted only about 58 percent of the entire irrigable area on which the capital costs had been predicated. However, the report stated that the companies did not have first-class water supplies for even the currently irrigated areas.



## RETURNS FROM FARMING OPERATIONS

Even with good land, adequate water supply, and a high percentage of land in crop production, there remains a factor that has had much to do with determining the amount of the irrigation benefit in relation to the cost of the water, and thereby the financial success of the enterprise. This factor is the returns from irrigation farming operations. As noted in discussing costs of irrigation water, the schedule of repayment of construction costs in most cases is inflexible; yet during the repayment period material changes may take place in the level of farm income. If the repayment period is long, substantial changes are sure to take place.

Annual costs estimated in planning some of the irrigation projects have been less than expected benefits by substantial margins. These margins although narrowed as a result of considerable decline in commodity prices after the financing, were not wiped out entirely. However, the history of the repayment experiences of irrigation projects shows that in many of the original financing plans, the margin of safety was not made wide enough to absorb the effect of extremely low farm prices which extended for several years.<sup>50</sup> Certainly the financing of many projects—including various plans that gave consideration to the relation between costs and returns, or purported to do so—has reflected undue optimism on the part of both promoters and planners.

Some irrigation-project financing that appeared sound enough to prospective water users and investors when prices were favorable could not meet the test of a major depression. The agricultural depression that followed World War I affected the fortunes of various irrigation enterprises. It was a contributing cause to the default of one mutual company studied. However, by far the heaviest impact of low farm prices during the present century occurred with the depression of the 1930's. Both high- and low-cost projects were affected, because the values of benefits from the water were so greatly reduced.

## EFFECTS OF DEPRESSION OF 1930'S UPON PROJECT CREDIT

*Projects with credit unimpaired.*—Although the depression of the 1930's took a heavy toll, the credit of many irrigation enterprises, including a number of those reported upon here, was not impaired. Some of these enterprises had little or no funded indebtedness at that time. Other organizations studied which kept their credit unimpaired, although in debt, were in general low-cost projects in general-farming regions, or projects with higher costs in areas of greater farm returns. In either case the cost was less than the sum the users could afford to pay during the depression.

*Projects that failed to meet obligations in full.*—A considerable number of enterprises with good repayment records before the de-

<sup>50</sup> The financing of many enterprises during their promotional periods allowed no margin of safety. With respect to even those projects initiated during periods of more conservative development, the disastrous effects of unusually low farm income have, on the whole, been considered and acted upon more generally in refinancing of enterprises that failed as a result of such conditions than they were in the original financing.



pression of the 1930's were unable to meet their payments in full during that period of low prices. The great drop in farm prices led to heavy delinquencies. After 2 or 3 years' accumulation, these delinquencies resulted in default. In other words, the value of benefits from irrigation water decreased greatly in the early 1930's, while the costs, if they decreased at all, did not do so in the same degree. Hence on many projects, water users were unable to meet their water charges. Because of this, the enterprise organizations, which necessarily depended upon payments from users, could not fulfill their obligations to creditors.

Of the 15 districts studied that had defaulted on bond payments at one time or another, only 1 had failed to meet its payments before the depression, although in 2 other cases, defaults were anticipated before 1930. Thirteen others that had issued bonds before the depression incurred their first defaults during that period. One that was formed in 1933 and issued bonds in 1937 has defaulted upon payments of both interest and principal. A wide diversity of costs and agricultural conditions obtained with respect to these districts. The larger number, with annual costs ranging from about \$1 to \$6 an acre, were located in general-farming areas. One, with a total annual charge averaging about \$6.50 an acre, served chiefly intensive crops, of which citrus constituted about half of the acreage. Three, with annual costs ranging from about \$6 to \$15 an acre, were principally deciduous-fruit districts. And two, with annual costs exceeding \$30 an acre, included chiefly citrus groves in one case and citrus and avocados in the other.

Four of the mutual companies reported upon here failed to meet their obligations in full at all times (two others were only temporarily behind on certain occasions). The default of one company resulted from inability to meet high costs for water from the farm returns prevailing during the depression that followed World War I. That of another was precipitated by the depression of the 1930's. In the two remaining cases, the difficulties were traceable mainly to flood disaster, and were accentuated by low returns from farming operations during the depression. These were all principally low-cost enterprises which served general farms, although most of the lands of the one having the highest cost were in orchards.

No commercial company studied was reported as having defaulted upon its obligations.

*Unfavorable factors coupled with low farm returns.*—In addition to the two companies noted above that suffered from flood disaster, several enterprises studied were adversely affected in one way or another. For example, one district had been subjected to heavy legal expense, extending over two decades, because of a controversy over its water rights. Another had adopted the policy of depending on receipts from "water-right" contracts for revenue for servicing its bonds, which proved to be a very poor source. Still another district had been promoted on a basis of orchards, which for several reasons failed. The farmers had not developed an alternative type of farming that would yield returns sufficient to pay the costs of the water, which were unavoidably high because

of the topography of the land. Other enterprises as well were affected by unfavorable conditions which, coupled with serious declines in farm income, resulted in an excess of costs over benefits.<sup>51</sup>

#### VARIABILITY OF COST-BENEFIT RATIOS

Annual costs of an irrigation project are subject to some change from year to year, but if the project is in debt the costs may include a high proportion of so-called "fixed charges." That is, charges for operation and maintenance may be raised or lowered within limits as conditions change. Likewise, although debt-service charges are fixed when the debt is incurred, some enterprises with good records have been able to reduce their annual debt charges by refunding their obligations without loss to creditors. Nevertheless, if all obligations are to be paid in full as due, an enterprise with substantial indebtedness ordinarily has little latitude in reducing its annual costs to meet changing conditions.

The amount of benefits, on the other hand, may fluctuate considerably from various causes. It is materially affected by changes in the level of farm income. Returns from farming operations during a given period are important in determining the amount of benefit from the water during that period. The low net returns from farming operations during the depression of the 1930's contributed heavily to decreases in the amounts of benefit then realized.

As benefit from water ordinarily is subject to greater change than the cost of the water, it follows that the ratio of cost to benefit for a given project is more or less variable. To take a typical case, if the irrigated area and quantity of available water within a heavily indebted project remained substantially the same during the early 1930's as in the preceding years, the value of benefit from the water materially decreased during those years of low commodity prices, whereas the cost did not decrease in the same proportion. It could not do so without substantial alteration in the terms of the indebtedness. In some cases in which the benefit before the depression was considerably greater than the cost, the decrease in benefit was not enough to eliminate the favorable margin, and these projects were able to meet their obligations. For these enterprises, the cost-benefit ratio, although changed, remained favorable. In other cases the margin was reversed—the benefit dropped below the cost and the cost could not be met.

#### RELATION OF TYPE OF ORGANIZATION TO SUCCESS OR FAILURE

The functions of organizing and financing the project, collecting revenue, and operating the irrigation system are performed better

<sup>51</sup> The difficulties of the two public power and irrigation district enterprises studied were not related to the depression. One, formed in 1933 and financed in 1936-37, suffered from loss of power revenue, from faulty planning of the irrigation distribution system, and from low contract rates for service of water. The irrigation division of the other, which in 1941 bought the system of a commercial irrigation company, did not default, although it is not a financial success. Efforts to establish a satisfactory relationship between cost and revenue are impeded by the multiplicity of types of water services and contracts that were taken over from the commercial company.



under some types of irrigation organization than under others. The degree of success or failure has been variously affected thereby. In most cases, however, it is difficult to conclude that a particular enterprise that has been successful under one kind of organization would have been a failure under a different kind, or vice versa.

#### MEETING FINANCIAL OBLIGATIONS

Different types of organizations vary widely as to their powers of collecting revenue, although probably in few cases have successes or failures resulted from this cause alone. The taxing power of irrigation districts has tended in some cases to stimulate the bringing of lands under irrigation and the collection of revenue for both irrigated and undeveloped lands. The simpler and speedier collection procedures followed by mutual companies have at times been more effective than those of districts in keeping up to date the payments by water users. Both mutual companies and taxing districts can increase their assessments to meet rising costs. Public utilities subject to public regulation may be authorized by regulatory agencies to raise their rates when necessary. But some commercial companies and districts that depend upon low annual payments fixed by contracts with water users have been unable to obtain enough revenue to meet their necessary costs. In these cases, however, the terms of the contracts, rather than the type of organization, have caused the trouble, as such water-service contracts legally may provide for variable payments.

Defaulting has been more common among districts than among mutual companies. However, as shown above, this is largely because districts are financed chiefly by sales of bonds to outsiders, whereas mutual companies as a rule are self-financed by the stockholders, who are also the water users. For some of the companies that have not defaulted, the total investment in the company may possibly be sufficiently in excess of the present value of the assets to be equivalent to heavy default or financial failure.

Although the differences among types of organizations in their financing and revenue-collecting powers and practices are important and are relatively advantageous or disadvantageous, these differences cannot offset costs of construction or operation unduly high in relation to the benefits conferred by the project. Costs are not significantly related to the type of organization. Although districts, on the whole, have been better able to finance their developments with the use of bonds than have private companies, the cost after the financing has been accomplished can be as high under one form of organization as under another.<sup>52</sup> Moreover, very little, if any, of a public-utility rate represents the return on investment to which utility owners are theoretically entitled. Nor do the benefits from water depend upon the type of organization. It seems doubtful whether in many cases the type of organization, in itself, is significantly related to financial success.

<sup>52</sup> Of the enterprises in the study having total annual charges for 1945 of \$10 or more per irrigated acre, four irrigation districts had charges ranging from \$12 to \$32 an acre; two mutual companies, \$14 and \$24; and two commercial companies, \$10 and \$24.



## DEVELOPMENT OF SUCCESSFUL IRRIGATION FARMING COMMUNITIES

Type of organization also is of relatively minor importance in the development of a successful irrigation farming community. Such a community implies a reasonable proportion of successful irrigation farms and of prosperous irrigation farmers. The prosperity of the water users depends on the profit they can make over and above their irrigation and other costs. With certain exceptions the rate that any organization charges its users for water depends primarily upon the construction and operation charges of the project. In any event, the cost of water can be modified only in relatively minor degree by differences among types of organizations in powers of financing and collecting revenue.

Successful communities have resulted from development by districts, by mutual companies, and by commercial companies. Because of their financing advantages, irrigation districts have been able to accomplish certain developments that were beyond the resources of existing mutual companies. This was emphasized in the case of several of the enterprises studied. In the then existing communities water users were able to pay the costs of the water that was available. The districts were formed primarily to extend the irrigated areas, to provide more water for greater crop production on existing irrigated farms, or both. In some instances the increased costs were less than the increased benefits; in other instances they proved to be too high when farm income declined to low levels. Some district projects that undertook entirely new development succeeded in creating successful irrigation farming communities. Many others failed financially, with severe loss not only to bond buyers but to settlers who had invested their capital and labor in irrigation farms. The present study included irrigation farming communities of all types of prosperity under each of the several types of irrigation organizations. The results do not disclose any significant correlation between type of organization and success of the irrigation farming community served by it.

## EFFICIENCY OF OPERATION

With respect to efficient and harmonious operation of an irrigation enterprise, the quality of management doubtless overshadows type of organization in importance in attaining successful operation. For the enterprises studied, harmonious relations between management and water users appeared to prevail generally among the districts and mutual companies. They were less prevalent with the commercial companies. However, there appeared to be little relation between quality of service rendered and type of organization. In a given situation a company form of organization with good management is perhaps likely to be more successful and satisfactory to all concerned than a district organization with poor management, and vice versa.

## SUMMARY OF RELATIONSHIPS

To sum up this discussion, it may be said that success or failure of an irrigation enterprise depends primarily on factors other than

type of organization, and that in probably very few instances has the type of organization, in itself, been chiefly responsible for success or failure. However, type of organization may be significantly related to the *degree* of success or failure, because of the relative advantages and disadvantages of the various types under differing circumstances.

## LITERATURE CITED

- (1) ADAMS, FRANK.  
1929. IRRIGATION DISTRICTS IN CALIFORNIA. Calif. Dept. Pub. Works,  
Div. Engin. and Irrig. Bul. 21, 421 pp., illus.
- (2) BALLANTINE, HENRY WINTHROP.  
1946. LAW OF CORPORATIONS. 992 pp. Chicago.
- (3) CALIFORNIA LAWS, STATUTES, ETC.  
1945. WATER CODE. San Francisco.
- (4) \_\_\_\_\_  
1947. CORPORATIONS CODE. CORPORATE SECURITIES LAW, ADDED 1949.  
SAN FRANCISCO.
- (5) \_\_\_\_\_  
1951. PUBLIC UTILITIES CODE. DIVISION 1. REGULATION OF PUBLIC  
UTILITIES. SAN FRANCISCO.
- (6) ERVIN, GUY.  
1919. IRRIGATION UNDER THE PROVISIONS OF THE CAREY ACT. U. S.  
Dept. Agr. Off. Sec. Cir. 124, 14 pp.
- (7) HOLSINGER, HENRY, AND CARL, JAMES M.  
1951. GENERAL COMPARISON OF CALIFORNIA WATER DISTRICT ACTS.  
Calif. State Dept. Pub. Works, Div. Water Resources, 54 pp.  
Sacramento, Calif. [Processed.]
- (8) HUTCHINS, WELLS A.  
1927. MUTUAL IRRIGATION COMPANIES IN UTAH. Utah Agr. Expt. Sta.  
Bul. 199, 51 pp.
- (9) \_\_\_\_\_  
1928. DELIVERY OF IRRIGATION WATER. U. S. Dept. Agr. Tech. Bul.  
47, 48 pp., illus.
- (10) \_\_\_\_\_  
1929. MUTUAL IRRIGATION COMPANIES. U. S. Dept. Agr. Tech. Bul.  
82, 50 pp.
- (11) \_\_\_\_\_  
1929. FINANCIAL SETTLEMENTS OF DEFAULTING IRRIGATION ENTER-  
PRISES. U. S. Dept. Agr. Cir. 72, 46 pp.
- (12) \_\_\_\_\_  
1930. COMMERCIAL IRRIGATION COMPANIES. U. S. Dept. Agr. Tech. Bul.  
177, 39 pp.
- (13) \_\_\_\_\_  
1931. SUMMARY OF IRRIGATION-DISTRICT STATUTES OF WESTERN STATES.  
U. S. Dept. Agr. Misc. Pub. 103, 127 pp.
- (14) \_\_\_\_\_  
1931. IRRIGATION DISTRICTS, THEIR ORGANIZATION, OPERATION AND  
FINANCING. U. S. Dept. Agr. Tech. Bul. 254, 93 pp.,  
illus.
- (15) \_\_\_\_\_  
1936. ORGANIZATION AND OPERATION OF COOPERATIVE IRRIGATION COM-  
PANIES. U. S. Farm Credit Admin., Coop. Div. Cir. C 102,  
54 pp., illus.
- (16) \_\_\_\_\_  
1936. MUTUAL IRRIGATION COMPANIES IN CALIFORNIA AND UTAH. U. S.  
Farm Credit Admin., Coop. Div. Bul. 8, 235 pp., illus.
- (17) \_\_\_\_\_  
1942. SELECTED PROBLEMS IN THE LAW OF WATER RIGHTS IN THE WEST.  
U. S. Dept. Agr. Misc. Pub. 418, 513 pp.
- (18) STOVER, A. P.  
1910. IRRIGATION UNDER THE CAREY ACT. U. S. Off. Expt. Stas., Ann.  
Rpt. for Year Ended June 30, 1910, pp. 461-488.
- (19) TEELE, R. P.  
1927. THE ECONOMICS OF LAND RECLAMATION IN THE UNITED STATES.  
329 pp., illus. Chicago and New York.



- (20) THOMAS, GEORGE.  
1920. THE DEVELOPMENT OF INSTITUTIONS UNDER IRRIGATION, WITH SPECIAL REFERENCE TO EARLY UTAH CONDITIONS. 293 pp., illus. New York.
- (21) UNITED STATES BUREAU OF THE CENSUS.  
1932. FIFTEENTH CENSUS OF THE UNITED STATES: 1930, IRRIGATION OF AGRICULTURAL LANDS. 487 pp., illus.
- (22) ———  
1942. SIXTEENTH CENSUS OF THE UNITED STATES: 1940, IRRIGATION OF AGRICULTURAL LANDS. 689 pp., illus.
- (23) ———  
1952. UNITED STATES CENSUS OF AGRICULTURE: 1950, v. 3, IRRIGATION OF AGRICULTURAL LANDS. INTRODUCTION AND SUMMARY. 102 pp., illus.
- (24) UNITED STATES, LAWS, STATUTES, ETC.  
1902. AN ACT APPROPRIATING THE RECEIPTS FROM THE SALE AND DISPOSAL OF PUBLIC LANDS IN CERTAIN STATES AND TERRITORIES TO THE CONSTRUCTION OF IRRIGATION WORKS FOR THE RECLAMATION OF ARID LANDS. U. S. Statutes at Large, v. 32, ch. 1093, p. 388. June 17, 1902.
- (25) ———  
1926. AN ACT TO ADJUST WATER-RIGHT CHARGES, TO GRANT CERTAIN OTHER RELIEF ON THE FEDERAL IRRIGATION PROJECTS, AND FOR OTHER PURPOSES. U. S. Statutes at Large, v. 44, ch. 383, p. 636. May 25, 1926.
- (26) ———  
1939. AN ACT TO PROVIDE A FEASIBLE AND COMPREHENSIVE PLAN FOR THE VARIABLE PAYMENT OF CONSTRUCTION CHARGES ON UNITED STATES RECLAMATION PROJECTS, TO PROTECT THE INVESTMENT OF THE UNITED STATES IN SUCH PROJECTS, AND FOR OTHER PURPOSES. U. S. Statutes at Large, v. 53, p. 1187. August 3, 1939.
- (27) ———  
1948. UNITED STATES CODE ANNOTATED. TITLE 26. INTERNAL REVENUE CODE.
- (28) UTAH, LAWS, STATUTES, ETC.  
1943. CODE ANNOTATED 1943. Salt Lake City, Utah.
- (29) WHEAT, C. I., VAUGHAN, R. L., AND CASSIDY, R. B.  
1927. RAILROAD COMMISSION OF THE STATE OF CALIFORNIA. Digest of Decisions, v. 1-29, 1912-1927, with list of all cases that have been the subject of court action. 577 pp. San Francisco.
- (30) WIEL, S. C.  
1911. WATER RIGHTS IN THE WESTERN STATES. Ed. 3, rev. and enl., 2 v. San Francisco.

☆ U. S. GOVERNMENT PRINTING OFFICE: 1953-261779

